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TRANSCRIPT OF [illegible]

Supreme Court of the United States

OCTOBER TERM, 1933

No. 440

BENJAMIN F. LINDHEIMER AND OTHERS, CONSTITUTING THE ILLINOIS COMMERCE COMMISSION OF THE STATE OF ILLINOIS; OTTO KERNER, ATTORNEY GENERAL OF THE STATE OF ILLINOIS, AND THE CITY OF CHICAGO, APPELLANTS,

vs.

ILLINOIS BELL TELEPHONE COMPANY

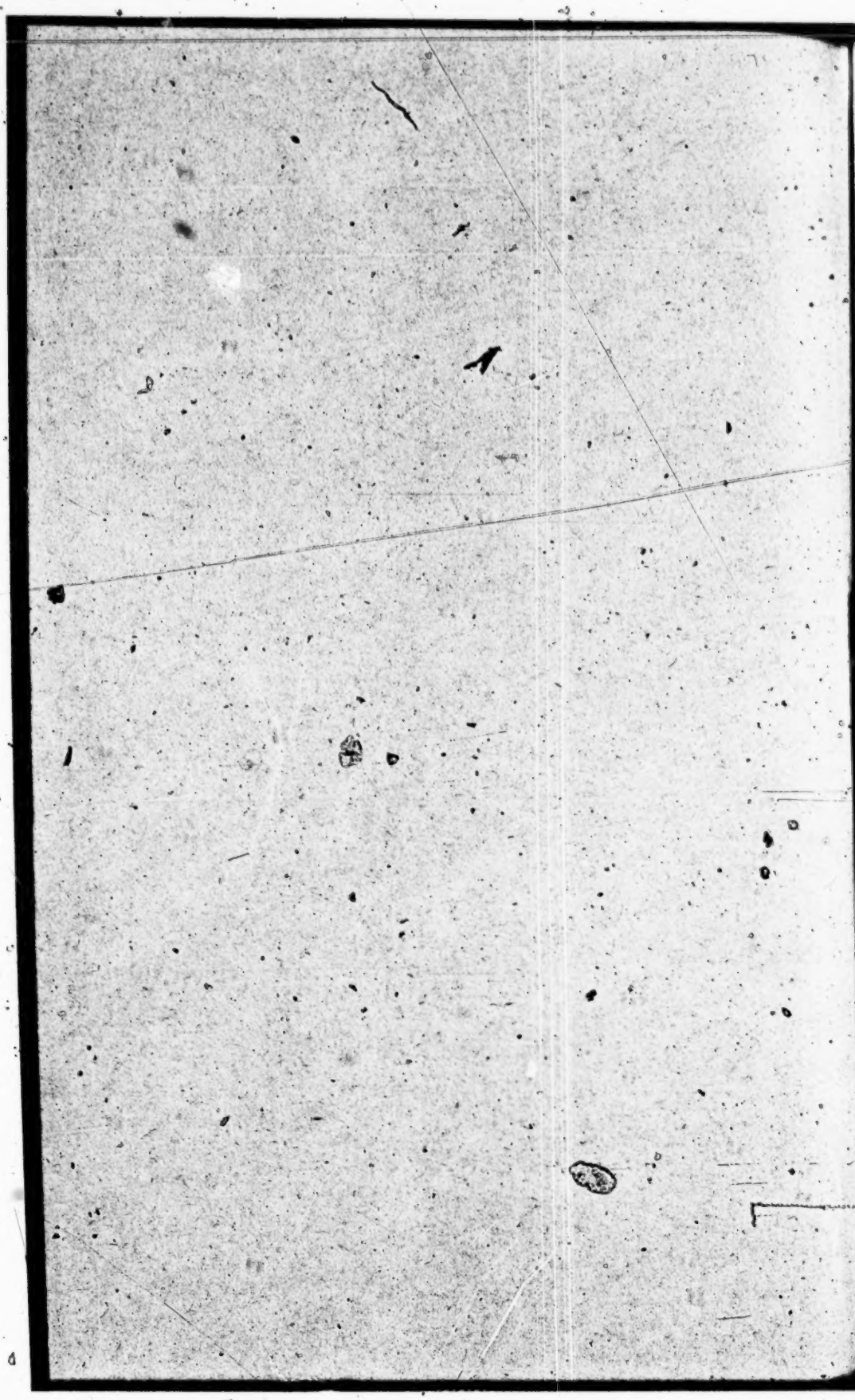
No. 548

ILLINOIS BELL TELEPHONE COMPANY, APPELLANT,

vs.

BENJAMIN F. LINDHEIMER AND OTHERS, CONSTITUTING THE ILLINOIS COMMERCE COMMISSION OF THE STATE OF ILLINOIS; OTTO KERNER, ATTORNEY GENERAL OF THE STATE OF ILLINOIS, AND THE CITY OF CHICAGO.

APPEALS FROM THE DISTRICT COURT OF THE UNITED STATES FOR THE NORTHERN DISTRICT OF ILLINOIS.



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7—Document testified to by witness Blair-Smith, consisting of several typewritten pages, dated April 30, 1931	3483	3179
8—Issue of October, 1930, Bell Telephone Quarterly; article contained on page 250 thereof written by witness Blair-Smith	3494	3191
9—Article contained on pages 316-327 of Bell Telephone Quarterly, entitled "1929 Convertible Bond Offer of A. T. & T." written and testified to by witness Blair-Smith	3497	3193
10—Article contained on pages 253-265, Bell Telephone Quarterly, October, 1926, entitled "1928 Stock Offer of A. T. & T. Co." written and testified to by witness Blair-Smith	3509	3204
11—Article contained on pages 253-269, Bell Telephone Quarterly, issue of October, 1926, entitled "1926 Stock Issue of A. T. & T. Co." written and testified to by witness Blair-Smith	3521	3214
12—Article contained on pages 262-269, Bell Telephone Journal, issue of October, 1924, entitled "The 1924 Stock Issue of A. T. & T. Co." written and testified to by witness Blair-Smith	3525	3216
17—Article written and testified to by witness Morsack appearing in Bell Telephone Quarterly of April, 1924, page 100, "Accounting in the Long Lines Department".	3526	3217

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18—Pages 565-66 of article appearing in July, 1928, Bell System Technical Journal entitled "Carrier Systems on Long Distance Telephone Lines" by H. A. Affel, C. S. Demarest, and C. W. Green.....	3528	3218
19—Pages 80-91 of Bell Telephone Quarterly of April, 1931, entitled "Milestones, Guideposts, and Footprints" by R. T. Barrett	3530	3219
20—Pages 92-102, Bell Telephone Quarterly of April, 1931, by W. L. Dusenberry, entitled "Teletypewriter Service and its Present-day Uses".....	3532	3220
21—Pages 114-131, Bell Telephone Quarterly, issue of April, 1925, by J. O. Perrine, entitled "The Development of the Transmission Circuit and Communication"...	3534	3221
22—Pages 141-149, Bell System Technical Journal, issue of January, 1930, by A. B. Clark, entitled "Wire Line Systems for National Broadcasting".....	3537	3223
24—Pages 181-194 of July, 1929, Bell Telephone Quarterly, by R. B. Parker, entitled "Telephone Typewriters and Auxiliary Arrangements".....	3539	3224
25—Article appearing in Bell Telephone Quarterly, issue of October, 1924, entitled "World's Telephone Statistics, 1923," by C. W. Foss of A. T. & T., appearing on pages 270-282.....	3541	3225
26—Article appearing in Bell Telephone Quarterly, issue of January, 1925, entitled "The Work of the Bell Telephone Securities Company," by D. F. Houston, appearing on pages 37-41.....	3542	3225
27—Article in the Bell Telephone Quarterly, issue of January, 1928, entitled "An Economic Review and Outlook" by F. E. Richter, appearing on pages 27-41.....	3543	3226
28—Pages 32-42, Bell Telephone Quarterly, issue of January, 1923, entitled "The Budget Plan of the Bell System," by C. A. Heiss.	3558	3239
29—Pages 138-149, Bell Telephone Quarterly, issue of July, 1931, entitled "World's Telephone Statistics, January 1, 1930".	3570	3239
30—Pages 150-163, Bell Telephone Quarterly, issue of July, 1931, entitled "Some Auxiliary Services and Facilities of the Bell System," by R. S. Coe.....	3571	3249

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31—Pages 2-12, Bell Telephone Quarterly, issue of April, 1922, entitled "The Radio Telephone Situation," by A. H. Griswold	3574	3251
32—Pages 13-22, Bell Telephone Quarterly, issue of April, 1922, entitled "The Work of the Bell Telephone Securities Company," by D. F. Houston	3581	3256
34—Pages 238-252, Bell Telephone Quarterly, issue of October, 1926, entitled "Some Problems of Statistics and Economic Research in the Bell System," by C. A. Heiss	3582	3256
35—Pages 23-33, Bell Telephone Quarterly, issue of January, 1926, entitled "An Economic Review and Outlook," by F. E. Richter	3584	3258
36—Pages 9-20, Bell Telephone Quarterly, issue of January, 1927, entitled "1926-1927, an Economic Review and Outlook," by F. E. Richter	3588	3261
37—Pages 520-522, Bell Telephone Technical Journal, issue of October, 1925, entitled "General Engineering Problems of the Bell System," by H. P. Charlesworth	3592	3263
38—Pages 542-560, Bell System Technical Journal, issue of October, 1925, entitled "Engineering Planning for Manufacture," by G. A. Pennock	3596	3266
39—Pages 1-14, Bell System Technical Journal, issue of January, 1925, entitled "Engineering Cost Studies," by F. L. Rhodes	3598	3268
40—Annual report of directors to stockholders of A. T. & T. for year ending December 31, 1920	3612	3283
41—Annual report of directors to stockholders of A. T. & T. for year ending December 31, 1921	3625	3292
42—Annual report of directors to stockholders of A. T. & T. for year ending December 31, 1922	3629	3295
43—Annual report of directors to stockholders of A. T. & T. for year ending December 31, 1923	3636	3300
44—Annual report of directors to stockholders of A. T. & T. for year ending December 31, 1924	3640	3302
45—Annual report of directors to stockholders of A. T. & T. for year ending December 31, 1925	3648	3308

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46—Annual report of directors to stockholders of A. T. & T. for year ending December 31, 1926	3660	3316
47—Annual report of directors to stockholders of A. T. & T. for year ending December 31, 1927	3669	3321
48—Annual report of directors to stockholders of A. T. & T. for year ending December 31, 1928	3676	3327
49—Annual report of directors to stockholders of A. T. & T. for year ending December 31, 1929	3689	3334
50—Annual report of directors to stockholders of A. T. & T. for year ending December 31, 1930	3701	3342
50-A—Annual report of directors to stockholders of A. T. & T. for year ending December 31, 1918	3714	3350
50-B—Annual report of directors to stockholders of A. T. & T. for year 1919	3717	3353
54 to 65, both inclusive—CR-51 for years 1919-1930, respectively	3722	3356
66 to 69, both inclusive—CR-51a for years 1919, 1920, 1921, and 1922, respectively	3752	3376
70—CR-51a for 1923	3759	3380
71—CR-51a for 1924	3761	3382
72—CR-51a for 1925	3763	3384
73—CR-51a for 1926	3765	3385
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75—CR-51a for 1928	3769	3388
76—CR-51a for 1929	3771	3390
77—CR-51a for 1930	3773	3391
104—Document testified to by witness Saxton, "$125,000,000 Total Issue A. T. & T. Company 35 Year Sinking Fund 5% Gold Debentures, dated January 1, 1925, due January 1, 1960"	3775	3393
105—Document headed as follows: "$100,000,000 A. T. & T. Company 20 Year Sinking Fund 5½% Gold Debenture Bonds, dated November 1, 1923, and due November 1, 1943"	3779	3403
106—Document headed $150,000,000 A. T. & T. Company 35 Year 5% Gold Debentures, dated February 1, 1930, and due February 1, 1965"	3783	3414
108—Tabulation prepared and testified to by witness Uhrig	3784	3416
110—Publication, dated April 15, 1931, "Bell Telephone Securities"	3785	3417

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111—Publication, Bell Telephone Securities, dated April 15, 1930	3799	3429
112—Publication, Bell Telephone Securities, issue of 1929, dated April 15th	3804	3433
113—Publication, Bell Telephone Securities, issue of April 15, 1928	3808	3436
114—Publication, Bell Telephone Securities, issue of April 15, 1927	3809	3437
115—Publication, Bell Telephone Securities, publication of May 1, 1926	3813	3439
116—Publication, Bell Telephone Securities, dated May 21, 1925	3814	3440
117—Publication, Bell Telephone Securities, issue of May 1, 1924	3815	3440A
118—Bell Telephone Securities, 1923 issue, dated May 1, 1923	3817	3441
119—Bell Telephone Securities, issue of May 1, 1922	3821	3444
132—Form of provisional estimate for year 1929.	3823	3446
134—Tabulation produced and testified to by witness Behan showing the amount of benefits to American Company resulting from the consolidated income tax return	3836	3447
139—Copies of CR-10 for years 1919 to 1930, both inclusive	3837	3447
142—Statement with reference to the revenues from special contract services and toll services	3842	3450
145—Bond circular of Ill. Bell Tel. Co.	3844	3451
146, 149-152, 155-158-161, 164-167-170, 173-176-179—Monthly reports, long lines, 1, 2 and 14, covering month of December for each of years 1919 to 1930, both inclusive	3847	3458
188—Article, Western Electric News, May, 1930, written and testified to by witness Burgess	3859	3470
189—Statement entitled "Patents and patent applications costing $1,000 or more, purchased by Western Electric, 1909 to 1930"	3862	3472
190—Document testified to by witness Folk, entitled "Licenses costing $1,000 or more, paid by Western Electric to others than A. T. & T., 1900-1930"	3863	3473
191—Document testified to by witness Folk, entitled "Federal Trade Commission, Radio Industry"	3864	3474

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192—Document purporting to be copies of certain contracts between Southwestern Telegraph and Telephone Co. and American Bell or A. T. & T. and Southwestern T. & T., resolutions of directors, etc.	3924	3536
193—Statement produced and testified to by witness Carter showing the departmental expenses, 1923-30	3967	3568
194—Paper which is entitled "Distribution of Provisional Estimates, 1932"	3969	3569
195—Statement of number of employes of Bell system, being A. T. & T. and associated companies and Western Electric, Bell Telephone Laboratories and 195 Broadway Corporation	3970	3670
196—Statement furnished by Mr. Folk entitled "A. T. & T. Company Patent Purchases ($1,000 or more) other than from Western Electric Company, 1909 to 1930, inclusive"	3971	3670
197—Statement referred to by Mr. Folk, entitled "A. T. & T. Company, patents purchased from and licenses sold to Western Electric Company, Inc., by A. T. & T. Co. and accounting disposition, years 1909 to 1930"	3974	3573
198—Article in Western Electric News, issue of January, 1929, pages 3 to 6, inclusive, entitled "The Bell System and Ourselves," by Edgar S. Bloom	3976	3574
200—Article in Western Electric News, issue of June, 1914, pages 1 to 4, inclusive, entitled "The Engineering Department of the Western Electric Co." by F. B. Jewett	3980	3575
201—Article in the Bell Telephone Quarterly, issue of January, 1929, pages 9 to 24, inclusive, entitled "Standardization in the Bell System" by H. S. Osborne	3984	3582
202—Article in the Bell Telephone Quarterly, issue of October, 1922, pages 12 to 24, inclusive, entitled "Notes on Radio" by O. B. Blackwell	4002	3595
204—Article in Bell Telephone Quarterly, issue of January, 1923, pages 18 to 31, inclusive, entitled "Engineering the Long Lines" by J. J. Pilliod	4005	3597

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205—Article in Bell Telephone Quarterly, issue of October, 1928, pages 304 to 312, inclusive, entitled "By-products of Telephone Research" by R. W. King	4008	3599
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D- 2—Statement as to Illinois Bell, per cent condition of manual central office telephone equipment	4020	3607
D- 3—Statement as to Illinois Bell, instructions for inspection of central office equipment, January, 1931	4021	3607
D- 7—Circular re $25,000,000 I. T. & T. Corp. 20-year 5½% convertible gold debenture bonds	4022	3608
D- 8—Circular re $40,000,000 New England T. & T. Co. 1st mortgage 4½% gold bonds, series B	4025	3616
D-12—Statement showing changes in Chicago schedule since October 1, 1923	4028	3622
D-15, Excerpts from Special Ordinances of Chicago, 1898, Vol. 2	4030	3623
D-16—Pamphlet, proceedings of city council, Chicago, November 6, 1907	4031	3624
D-18—Pamphlet, an ordinance fixing the maximum rates for telephone service, passed by city council May 20, 1913	4048	3639
D-19—Statement as to Western Electric, analysis of cost of sales by Bell and non-Bell customers	4061	3654
D-25—Statement as to Western Electric, pension fund transactions	4062	3655
D-26—Actuarial computations of required pension accruals, 1916-1930, and minimum fund required	4063	3655
D-27—Details of journal entry for extraordinary plant depreciation, December 31, 1927	4064	3656
D-28—Statement as to Western Electric Co., Inc., extraordinary reserve against plant to bring additions to estimated cost level, 1931-1940 (2 sheets)	4065	3657
D-29—W. E. construction cost indices, as prepared by plant engineering department and general statistical department, 1914, 100 (13 sheets)	4067	3659
D-30—Statement showing net increases in the plant during 13-year period, 1916-1930, inclusive	4080	3674

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D-31—Details of reserve for depreciation of plant during 15-year period 1916-1930, showing gross additions to reserve and write-offs...	4081	3671
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D-33—Explanation of reserve carried on Western Electric books as of December 31, 1926, against investment in stock of Graybar (2 sheets)	4084	3677
D-34—Statement of assets and liabilities of Graybar Electric.....	4086	3678
D-35—Comparison of book value and depreciation reserve of Western Electric and Bell Telephone laboratories.....	4087	3679
D-36—Explanation of reserve on books of Western Electric as of December 31, 1926, against demand notes of Bell Telephone laboratories	4088	3679
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D-39—Statement—"Conditions under which we extend the benefits of the standard supply contract to Bell connecting companies"...	4090	3681
D-41—Analysis of sales to Bell customers, 1916-1930	4091	3682
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D-47—Statement showing method of arriving at merchandise inventories as shown on the stockholders' reports as of December 31, 1915, and December 31, 1930.....	4094	3685
D-48—Statement showing sales of apparatus and equipment designed entirely or in part by Western Electric Company, Inc., but manufactured by others, included in sales of manufactures to Bell Companies on Exhibit No. 31004.....	4095	3686
D-49—Statement as to Graybar Electric, sales and estimated net profits on Western Electric manufactures, 1926-1928.....	4096	3687
D-50—Statement as to Graybar Electric, earnings for years 1926, 1927, and 1928.....	4097	3687
D-51—Statement as to Graybar Electric, statement of assets and liabilities, 1926-1928.....	4098	3688
D-52—Statement showing A. T. & T. loans to Western Electric, 1918-1930.....	4099	3690
D-53—Balance sheet at September 30, 1930, Teletype Corporation.....	4101	3693

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D-55—Condensed summary of results for 1931, compared with 1930, Teletype Corporation	4103	3694
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D-57—Statement showing average investment non-Bell business, 1916-1930, inclusive	4105	3696
D-61—Analysis of profits on business other than with Bell Telephone Companies from 1881 to 1927, inclusive, Western Electric Co.	4106	3697
D-62—Opening balance sheet, May 31, 1930, W. E. C. O. Corporation	4107	3698
D-63—Statement re assets, W. E. C. O.	4108	3699
D-64—Statement showing average investment compiled from consolidated balance sheets at December 31 of Western Electric Co. and subsidiaries, 1915 to 1930	4109	3700
D-65—Explanatory sheet re D-64	4110	3701
D-66—Statement showing net profits on investments (combined) as reported	4111	3702
D-68—Statement showing consolidated earnings of Western Electric and subsidiaries, 1916-1930	4112	3702A
D-69—Statement showing patents sold to and licenses purchased from A. T. & T. by Western Electric, Inc., and accounting disposition, 1916-1930	4113	3703
D-70—Agreement between Western Electric and Stromberg-Carlson, dated August 13, 1923	4114	3704
D-71—Agreement between Kellogg Switchboard and Western Electric, dated June 2, 1914	4120	3709
D-72—Description of Western Electric costs	4127	3716
D-73—Statement as to Western Electric, Investment in Products Company	4133	3723
D-74—Condensed summary of results for years 1927-1930, inclusive, E. R. P. 1	4134	3724
D-75—Analysis of principal items appearing on Products Company report No. 1 for years 1927, 1928, 1929 and 1930, under operations, E. R. P. 1	4134	3725
D-77—Analysis of capital stock structures since commencement of business to December 31, 1930, Western Electric	4143	3731
D-78—Analysis of 1925 cost of sales, Western Electric	4146	3735
D-79—Analysis of 1930 cost of sales, Western Electric	4147	3737
D-80—Statement showing relation of manufacturing department surplus to standard shop output, 1921-1930	4148	3738

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D-81—Statement showing standard and current cost of copper bar and lead purchased by manufacturing department, 1918-1931	4149	3738
D-82—Letter, dated May 26, 1927, signed by Edgar S. Bloom, president, to H. L. Gary, Kansas City, Mo., re memorandum of agreement between International Telephones Sales & Engineering Corporation and E. R. P. I.	4150	3738
D-83—Statement showing approximate purchases from certain suppliers, 1916-1930	4151	3739
D-84—Statement showing rented area leased July 1, 1929, and after at manufacturing locations	4152	3740
D-85—Statement showing additions to pension fund in 1931	4153	3740
D-86—Statement showing depreciation expense included in cost of plant made, 1919-1931, inclusive	4154	3741
D-87—Statement showing total 1929 average investment, Bell and non-Bell business with percentage apportioned on basis of standard cost of sales	4155	3741
D-88—Statement showing total 1929 expenses and operating interest, Bell and non-Bell business with percentage apportioned on basis of standard cost of sales	4156	3742
D-89—Resolutions of board of directors authorizing extraordinary depreciation	4157	3742
D-90—Statement showing extraordinary depreciation on plant, 1924, 1925, and 1926	4158	3743
D-92—Pamphlet, "The Telephone Company as a Citizen of Your Community", an address by F. O. Hale, April 2, 1931	4185	3750
D-93—Statement of total expense on radio to December 31, 1931	4187	3751
D-94—Statement as to department of development and research, expense of development work for year 1920	4188	3751
D-95—Statement as to department of development and research, comparison of principal expenditures with budget, December 31, 1921	4189	3752
D-96—Statement as to department of development and research, comparison of expenditures with budget, for year ending December 31, 1922	4190	3752
D-97—Statement showing number of employees of Western Electric Company, Inc., 1916-1930	4191	3752

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D-98	Bill of sale, A. T. & T. to Illinois Bell Telephone Co., dated December 31, 1927 (form D-261) (1)	4192	3753
D-99	Statement as to A. T. & T., prices charged licensee companies for instruments based on average current cost to A. T. & T. less 20%	4193	3753
D-100	Statement as to A. T. & T., analysis of reserve for depreciation of telephone instruments, years 1923-1927	4194	3754
D-101	Certified copy of letter dated New York March 24, 1921, to Frank S. Fowler, Chief of Depreciation Section, Interstate Commerce Commission, Washington, D. C., by Mr. C. A. Heiss, comptroller of A. T. & T.	4195	3755
D-102	Statement showing prices of transmitters, receivers, and induction coils sold to both Bell and non Bell customers from January 1, 1916, to December 31, 1925	4203	3762
D-103	Statement showing prices of transmitters, receivers, and induction coils sold to Bell and non Bell customers from January 1, 1926, to December 31, 1930	4206	3762
D-104	Statement showing sales of telephone receivers, transmitters, and induction coils, 1916-1930, inclusive	4207	3763
D-111	Statement as to A. T. & T., royalties received from Western Electric Company, Inc., Electrical Research Products, Inc., and others, 1923-1931	4208	3764
D-112	Copy of agreement, dated July 8, 1919, between International Telephone Sales & Engineering Corporation and A. T. & T.	4209	3765
D-115	Copies of Exhibits 69-AA, 69-BB, 69-CC, 69-DD, 69-EE, 69-FF, certified by master in chancery in Michigan Bell case	4214	3769
D-116	Heiss Exhibit No. 10 (3 sheets)	4216	3772
D-119	Statement as to Merrimac Exchange, historical data of mortality study of central office equipment	4219	3774
D-120	Statement as to Merrimac Exchange, historical data of mortality study of buildings	4220	3774
D-121	Statement as to Beverly Exchange, historical data of mortality study of central office equipment	4222	3774
D-122	A. T. & T. instrument credit, Bell System	4223	3775

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D-123 Article entitled "The Straight Line Depreciation Accounting Practice of Telephone Companies in the United States" by Crunden and Belcher, Bell Telephone Quarterly, October, 1929	4224	3776
D-125 Advertisement on back cover of Bell Telephone News, February, 1934	4261	3808
D-126 Statement re Illinois Bell Telephone Company, Chicago Exchange, estimated costs in connection with subscriptions for A. T. & T. Co. stock under the employees' stock plan	4262	3809
D-127 Same, except under the Bell Telephone Securities Co. plan	4263	3810
D-128 Advertisement entitled "Our Slogan: 'Every Subscriber a Stockholder'"	4264	3811
D-129 Statement re Illinois Bell Telephone Company, amounts billed to the Bell Telephone Securities Company for services rendered by Illinois Bell in connection with rights, transactions, and related stock and bond subscriptions	4265	3811
D-130 Statement as to Illinois Bell Telephone Company, same in connection with the sale of A. T. & T. Company stock to the public	4266	3811
D-131 Statement as to Illinois Bell Telephone Company, amount of collections and amount of remittances made to the A. T. & T. Co. in connection with the employees' stock plan during years 1923 to 1931	4267	3812
D-132 Statement as to Illinois Bell Telephone Company, amount of collections and amount of remittances made to the Bell Telephone Securities Company in connection with the sale of A. T. & T. Co. stock under the Bell Telephone Securities Company plan for years 1923 to 1931	4268	3812
D-133—Statement as to Illinois Bell Telephone Company, amount of collections and amount of remittances to A. T. & T. Co. and Bell Telephone Securities Co. in connection with rights, transactions, and related stock and bond subscriptions	4269	3812
D-135—Copy of assignment from Electrical Research Products, Inc., to Western Electric	4270	3813
D-136—Statement showing net profits on sales of new A. T. & T. instruments, 1916 to 1927, inclusive	4274	3816
D-137—Document entitled "Net Profits on Sales of New A. T. & T. Instruments, 1916-1926, Inclusive"	4275	3816A

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D-138—Statement as to Illinois Bell Telephone Company, Chicago area, comparison of depreciation expense actually charged for certain accounts and as modified on basis of present view (1932)	4277	3818
D-139—Statement as to Illinois Bell Telephone Company, Chicago area, data requested by Mr. Goldstein	4306	3825
D-140—Statement as to Illinois Bell Telephone Company, average realized life study of central office equipment	4307	3826
X- 1—Illustration that test applied in City's Exhibit No. 95 is not affected by choice of base year having different proportions of material and labor	4309	3827
X- 2—Illinois Bell Tel. Co., Chicago Exchange, measurement of error in percentages of increase in plant costs used in Plaintiff's Exhibit No. 1, on assumption that increases in material and labor costs are correct, account 241, exchange pole lines	4311	3828
X- 3—Studies re productivity of labor	4312	3828
X- 4—Illinois Bell Tel. Co., Chicago Exchange, table to illustrate that reduction in labor cost from any cause is not fully reflected in Plaintiff's Exhibit No. 1, account 241, exchange pole lines 1922-3	4314	3829
X- 5—Illinois Bell Tel. Co., Chicago Exchange, comparison of gang make-ups as of June 30, 1923, used in Plaintiff's Exhibits Nos. 1 and A-2, exchange outside plant	4315	3830
X- 6—Valuation Illinois Bell Tel. Co., Chicago Exchange, comparison between company experience and Plaintiff's Exhibit No. 1	4316	3831
X- 7—Illinois Bell Tel. Company, Chicago Exchange, comparison between sizes of plant items placed on specific and routine estimates, 1921, 1922, and 1923	4333	3841
X- 8—Valuation Illinois Bell Tel. Co., Chicago Exchange, labor hour performance on specific and routine estimates	4335	3842
X- 8A—Corrected sheets for Exhibit X-8	4368	3863
X- 9—Valuation Illinois Bell Tel. Co., Chicago Exchange, comparison between company experience on its larger construction projects and Plaintiff's Exhibit No. 1	4369	3866
X- 9A—Corrected sheets for Exhibit X-9	4380	3875
X-10—Illinois Bell Tel. Co., Chicago Exchange, material and labor ratios used in Plaintiff's Nos. 1, A-2 and A-10, inclusive	4384	3878

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X-11—Valuation Illinois Bell Tel. Co., Chicago Exchange, labor hour performance on specific estimates 1929	4385	3879
X-12—Valuation Illinois Bell Tel. Co., Chicago Exchange, June 30, 1923, portion of December 31, 1929, appraisal priced on basis of wholesale construction and 1929 material and labor cost levels	4396	3887
X-12 (a)—Statement showing effect of assumed errors in percentages of increase in labor costs in Plaintiff's Exhibits A-2 to A-10, inclusive, account 242, exchange aerial cable	4403	3890
X-13—Comparison between costs used in Sloan appraisals and costs of Western Electric Company apparatus installation equipment specifications	4406	3891
X-13 (a)—Statement showing estimated effect of price changes on apparatus and equipment sold to Bell Company, 1921-1930, statement B	4408	3892
X-13 (b)—Statement showing price trend on installation work performed for Bell Telephone Companies 1923-1925=100	4409	3892
X-14—Price indices all commodities, copper, lead	4410	3892A
X-15—Statement re Western Electric, profit and loss year 1929	4413	3892a
X-16—Western Electric, analysis of basic gross profit year 1929	4414	3892b
X-34—Summary sheets showing gross profits and adjustments by year 1916-1931, both inclusive	4416	3892c
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X-36—Western Electric Company, Inc., summary of details of manufacturing department surplus items resulting in the net figures shown in Exhibit D-80	4420	3893
X-37—Western Electric Co., Inc., summary of details of manufacturing department surplus items resulting in the net figures shown in Exhibit D-80 combined in groups by series of years	4422	3896
X-38—Western Electric Company, Inc., comparison of total amounts of manufacturing, inventory and reserves adjustments, with amounts thereof included in Exhibit D-80	4424	3900
X-39—Statement re Western Electric Company, Inc., division of operating surplus, total apparatus and equipment and lead covered cable 1921 to 1930, inclusive (dollars in thousands)	4426	3903

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X-40—Graph showing variations between standard cost and actual cost of purchases of lead by Western Electric for Hawthorne works....	4427	3904
X-41—Same covering copper bars.....	4428	3904
X-42—Same as X-40 expressed in percentages.....	4429	3904
X-43—Graph showing comparison between standard cost and actual cost of purchases of copper bars by Western Electric for Hawthorne works	4430	3904
X-44—Graph showing comparison between standard cost and actual cost of purchases of lead by Western Electric for Hawthorne works....	4431	3904
X-45—Same as X-44 per 100 pounds.....	4432	3904
X-46—Same as X-41 expressed in percentages.....	4433	3904
X-47—Same as X-43 per 100 pounds.....	4434	3904
X-47 (a)—Statement re Western Electric Company, Inc., standard cost per 100 of selected items with dates, adoption as extracted from Bulletin A-451-1 of indicated years (Hawthorne plant)	4435	3905
X-48—Statement showing average investment, net profits, and percentage of return (per Exhibits A-77 and A-79), Bell and non-Bell business for the years 1916 to 1930 (1).....	4438	3908
X-49—Statement showing average investment per Exhibits A-77, A-79, and A-77 and A-79, combined, adjusted to exclude excessive cash, current liabilities, reserve for pension fund and reserve for depreciation; Bell and non-Bell business.....	4439	3909
X-49½—Sheet from Poor's 1930 Manual entitled "Public Utilities (Western Electric Co., Inc.)"..	4442	3912
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X-55—Statement showing average investment per Exhibits A-77, A-79, and Exhibits A-77 and A-79 combined, adjusted (after depreciation), profits as adjusted and percentage of return, Bell and non-Bell business	4453	3922
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X-67—Statement re Western Electric, return on investment in International Western Electric Company, years 1918 to 1925	4462	3927
X-69—Statement re Western Electric, investment in International Western Electric, years 1918-1925	4463	3927
X-70—Statement re Western Electric Company, Inc., investment in International Western Electric Company, Inc. Giving effect to accumulated earnings, years 1918 to 1925	4464	3928
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X 121 Statement re A. T. & T. Co., percent of relationship of book value of investment in telephone instruments to depreciation reserve for telephone instruments, compared with percent of depreciation deducted from book cost or current value new as the basis for sale to long lines and to licensee companies, as of December 31, 1927	4588	4024
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X 123—Statement showing dividend rates of licensee companies during years 1914 to 1930, inclusive	4590	4026
X 124—Statement showing capital stock holdings in licensee companies showing dividend rates and yields thereon during years 1920, 1921, and 1922, and from 1923 to 1930, inclusive	4591	4027
X 126—Statement showing dividend yields on investments in capital stocks of licensee companies during years 1920 to 1930, inclusive	4592	4027
X 127—Statement showing average return to A. T. & T. from dividends on its investments in capital stocks of licensee companies converted into average return to stockholders of A. T. & T. on their investments in capital stock of A. T. & T. during years 1920 to 1922, and during years 1923 to 1930, inclusive	4593	4028
X 128—Statement showing profit on investment in capital stocks of licensee companies during years 1920 to 1922, and during years 1923 to 1930, inclusive	4594	4029

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X-129—Statement showing ratio of capital stock holdings of Ill. Bell to capital stock holdings in all licensee companies; ratio of profit on stock holdings in Ill. Bell to profit on stock holdings in all licensee companies and percentages of profit on stock holdings during years 1920 to 1922, and during years 1923 to 1930, inclusive	4595	4030
X-130—Statement showing amounts required in order to receive the same percent of return on investment in capital stock of each licensee company as received from investment in capital stock of Illinois Bell Tel. Co. during years 1920 to 1922, and during years 1923 to 1930, inclusive	4597	4030B
X-131—Statement showing losses on loans to licensee companies prorated between companies, years 1920 to 1922, and 1923 to 1930, inclusive	4601	4030F
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X-133—Statement showing average return from dividends and interest on investments (stocks and loans) in licensee companies during years 1920 to 1922, and 1923 to 1930, inclusive	4612	4030S
X-134—Statement showing average return to A. T. & T. from dividends and interest on its investments (stocks and loans) in licensee companies, converted into average return to stockholders of A. T. & T. on their investments in capital stock of A. T. & T. during years 1920 to 1922, and 1923 to 1930, inclusive	4614	4030T
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X-136—Statement showing percentage relationships of average investments in capital stocks of licensee companies and in loans to licensee companies to total average investments (stocks and loans) in licensee companies years ended December 31, 1920 to 1922, and 1923 to 1930, inclusive	4618	4033

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X-137—Statement showing amounts required in order to receive the same per cent of return on investment (stock and loans) in each licensee company as received from investment in Ill. Bell during years 1920 to 1922, and 1923 to 1930, inclusive	4619	4034
X-140—Statement re A. T. & T., cost of other services performed under license contract prorated to licensee companies on basis of license payments, years 1920 to 1930, inclusive. Departmental costs incurred in rendering licensee contract services during years 1920 to 1930, inclusive	4620	4035
X-142—Statement re A. T. & T. Co., separation of the license payments of each licensee company into component parts of cost and profit, years ended December 31, 1920 to 1922, and years 1923 to 1930, inclusive	4624	4039
X-143—Statement re A. T. & T. Co., items shown in Exhibit X-142 reduced to percents of the license payment and to amounts per telephone station, years ended December 31, 1920 to 1922, and years ended December 31, 1923 to 1930, inclusive	4638	4051
X-145—Statement re A. T. & T. Co., return on investment from license contract operations with various licensees during years 1920 to 1922, and during years 1923 to 1927, inclusive	4646	4059
X-148—Statement re A. T. & T. Co., separation of the license payments of Illinois Bell Tel. Co., Chicago division, of other licensee companies (including Ill. Bell Tel. Co., exclusive of Chicago division) and of long lines department, into component parts of cost and profit based on Plaintiff's Exhibit A-170 and underlying exhibits referred to therein, during years 1923 to 1931, inclusive	4648	4060b
X-149—Statement re A. T. & T. Co., return of investment from license contract operations with Illinois Bell Telephone Co., Chicago division, with other licensee companies (including Illinois Bell Tel. Co., exclusive of Chicago division), and with long lines department, computed from Plaintiff's Exhibit A-170 and underlying exhibits referred to therein, during years 1923 to 1927, inclusive	4650	4063c
X-150—Statement re A. T. & T. Co., return from license contract operations with Ill. Bell Tel. Co., Chicago division, in excess of the average return from license contract opera-		

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tions with other licensee companies (computed from Plaintiff's Exhibit A-170 and underlying exhibits, referred to therein) during years 1923 to 1927, and during years 1928 to 1931, inclusive	4651	4061
X-151—Statement re American Telephone and Telegraph Company, return from license contract operations under present rates and under attacked rates with Illinois Bell Telephone Co., Chicago division, in excess of the average return from license contract operations with other licensee companies (computed from Plaintiff's Exhibit A-170 and underlying exhibits referred to therein) during years 1923 to 1931, inclusive	4653	4063
X-153—Statement re Ill. Bell Tel. Co., comparison of cash payments to Western Electric Company with cash obtained in stock and loans from American Tel. & Tel. Co., years 1923 to 1930, inclusive	4654	4065
X-154—Illinois Bell Tel. Co., Chicago exchange, mortality study of exchange aerial cable	4655	4065
X-155—Illinois Bell Tel. Co., Chicago division, summary of account 102, reserve for accrued depreciation, twenty-one years, 1910-1931, inclusive	4656	4067
X-156—Illinois Bell Tel. Co., Chicago division, summary of depreciation reserve, 1909 to 1931, inclusive	4658	4070
X-158—Statement re Illinois Bell Tel. Co., Chicago division, comparison of Commission's allowance for maintenance and depreciation with actual charges for maintenance and depreciation accruals per company's books and actual charges for retirements per company's books, 1923-1931	4659	4070
X-159—Illinois Bell Tel. Co., Chicago division, summary of account 102, reserve for accrued depreciation after giving effect to the Illinois Commerce Commission's order beginning October 1, 1923, 22 years, 1910-1931, inclusive	4661	4072
X-160—Statement re Illinois Bell Tel. Co., Chicago division, comparison of Commission's allowance for depreciation (based on Public Utilities Commission order No. 9291, effective January 1, 1921) with depreciation accruals as per the company's books, and actual charges for retirements as per company's books, 1923-1931	4662	4072

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X-162—Illinois Bell Tel. Co., comparative study of balance in account 103, reserve for amortization of intangible capital by divisions, 1913 to 1931, inclusive	4664	4074
X-163—Illinois Bell Tel. Co., comparative study of combined balances of accounts 102, reserve for accrued depreciation and 103, reserve for amortization of intangible capital by divisions, 1913 to 1931, inclusive	4665	4075
X-166—Statement re Illinois Bell Tel. Co., combined balances of accounts 102, reserve for accrued depreciation and account 103, reserve for amortization of intangible capital expressed as a ratio of the investment in fixed capital, 1913 to 1931, inclusive	4666	4076
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X-169—Statement re Illinois Bell Tel. Co., Chicago division, gross additions to fixed capital, eighteen years, January 1, 1913, to December 31, 1930	4668	4076
X-172—Statement showing investment in fixed capital by operating divisions, 1882-1930, total investment 1931	4669	4077
X-175—Statement re Illinois Bell Tel. Co., Chicago division, summary of account 102, reserve for accrued depreciation after giving effect to the Public Utilities Commission's order during the entire period from January 1, 1921, to December 31, 1931; 22 years, 1909 to 1931, inclusive	4671	4080
X-176—Statement re Illinois Bell Tel. Co., City of Chicago, details of amounts reserved for depreciation and charged to operating expense account No. 608, "depreciation of plant and equipment," eleven years, 1921 to 1931, inclusive	4672	4080
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X 182 Statement re Illinois Bell Tel. Co., Chicago division, depreciation on exchange aerial wire (account 243), 18 years, January 1, 1913, to December 31, 1930	4676	4083
X-185—Illinois Bell Tel. Co., City of Chicago, comparative study of percent condition or percent value as of December 31, 1930, expressed as a percentage of value when new as determined by average life method and as determined by the company	4677	4084
X-186—Illinois Bell Tel. Co., City of Chicago, comparative study of percent condition or present value as of December 31, 1930, expressed as a percentage of value when new as determined by age, life method and as determined by the company	4678	4086
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X 188—Statement re Illinois Bell Tel. Co., Chicago division, investment in central office telephone equipment at December 31, 1923 to 1931, inclusive, and April 30, 1932	4680	4089
X-189—Statement re Ill. Bell Tel. Co., Chicago division, comparison of gross additions and retirement of manual central office telephone equipment, 1930 and 1931, with the company's estimates shown on 1929 study	4681	4090
X-192 C. R. 51A for 1931	4682	4090B
X 193 C. R. 38	4683	4090C
X-194—Balance sheets and income statements, R. E. 1, for 1923, 1925, 1928, 1929, 1930, 195 Broadway Corporation	4687	4091
X-196—Balance sheets and income statements, R. E. 11, for 1923, 1925, 1926, 1927, and 1928, 205 Broadway Corporation	4691	4092
X-197—Pay roll and occupancy report, R. E. 12, for 1924, 1925, and 1926, 205 Broadway Corporation	4693	4093
X-198—Occupancy reports, R. E. 12-A, 1927, 1928, 1929, 1930, 195-205 Broadway Corporation	4696	4094
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	panies, C. R. 7.14 for years 1921, 1924, 1925, 1926, 1927, 1929, 1930	4709	4096
X 206	A. T. & T., C. R. 14, cash statements, 1923-1930	4708	4104
X 207	Statement re A. T. & T., operating revenues shown separately for long lines, license and holding company, 1920-1931 (schedule 310 of report to I. C. C.)	4718	4114
X 208	Statement re A. T. & T., operating expenses shown separately for long lines, license and holding company, 1920-1931 (schedule 320 of report to I. C. C.)	4738	4134
X 211	Bell Telephone Laboratories, M. 8.00 reports, balance sheets for December 31, 1924, January 1, 1925, and sheet explaining entries December 31, 1929, December 31, 1930	4750	4146
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X 221	Trust agreement, pension fund, any other company and Bankers Trust Co., December 31, 1927	4770	4159
X 222	Memorandum relative to actuarial determination of accrual charges for service pensions on the full service basis, A. T. & T. Co.	4773	4162
X 224	Illinois Bell, copy of resolutions	4796	4181
X 225	Statement re A. T. & T. Co., funds of associated companies temporarily placed with A. T. & T. Co. until required by them (averaged) years 1923-1930	4799	4185
X 226	Statement re Western Electric Company, Inc., analyses of cost of sales, 1925 and 1930	4800	4186
X 227	Chart, cost to companies, yield to public and spread between cost and yield on offering price of bonds	4802	4190
X 228	Chart, spread between annual cost to company and yield on public offering price, 330 bond issues 1921-1931, aggregating $6,138,000,000	4803	4190
X 229	Comparative statement showing cost to companies and yield to public on bonds issued by Bell System, railroads, and public utilities (other than Bell System), average for each year 1921 to 1931, inclusive	4804	4191
X 231	Chart, bonds grouped by ratings (Moody's) showing amount in each group and its pro-		

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	portion to total offering, 878 issues 1923-1931, aggregating $14,345,000,000	4805	4192
X-232	Comparative summary showing amount offered and proportion of total offerings of Bell System, railroad, public utility (other than Bell System) and industrial and other bond issues of $5,000,000 and over issued during years 1923 to 1931, inclusive, grouped according to investment rating at time of public offering	4806	4192B
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X-234	Chart, trend of spread between annual cost to company and yield on public offering price, 271 bond issues 1923-1931, aggregating $5,184,000,000 grouped by ratings (Moody's)	4810	4192E
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X-237	Statement showing average yield on bonds sold during years 1923 to 1931, inclusive, classified according to investment rating when issued; Bell System, railroads, public utilities, industrials and others (includes issues of $5,000,000 or over, yield based on offering price)	4813	4197
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X-241	Statement showing average bond yields based on resale prices during each year, 1923 to 1931, inclusive, Bell System, railroads, pub-		

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	lic utilities, industrials (based on high and low market prices of issues of $5,000,000 and over)	4820	4205
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X 246	Chart, range of averages of bond yields on public offering price grouped by ratings (Moody's), 829 issues, 1923-1931, aggregating $13,809,000,000	4833	4216
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X-248	Chart, range of averages of high and low bond yields on resale from date of issue to 1931, grouped by ratings (Moody's) in year of resale	4835	4218
X-249	Statement showing range of averages of high and low bond yields on resale prices grouped by investment rating (Moody's) in year of resale, 1923 to 1931, inclusive, etc	4836	4218
X-250	Chart, public utilities, average yield on common stocks compared with average yield on bonds, grouped according to Moodys' rating of the companies' bonds	4840	4218
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X-253—Statement showing sources of funds invested in fixed capital in Illinois Bell Tel. Co.	4844	4223
X-254—Chart of Illinois Bell, sources of funds invested in fixed capital	4847	4228
X-255—Statement re Illinois Bell, entire Co., investment in fixed capital compared with total capital obligations and surplus, 1913-31	4848	4228
X-256—Statement showing average cost of funds used in busines of Illinois Bell	4849	4229
X-257—Statement showing average yield on bonds of Illinois Bell and on bonds of other public utilities operating in Chicago (exclusive of transportation companies) 1923-31	4850	4230
X-258—Statement showing securities issued under the authority of the Illinois Commerce Commission and its predecessor in comparison with all public utility issues in the United States	4851	4232
X-259—Statement re A. T. & T., common stock, high and low selling prices and yields 1901-1931	4852	4232
X-260—Statement showing yields and average yields on high and low market prices of common stocks of Bell System companies sold on exchanges, 1921-31	4854	4234
X-261—Statement showing amount of and high, low, and average annual yields on all bonds of Bell Telephone System, railroads, public utilities and industrial corporations, issued in amounts of $5,000,000 and over, maturing in five years or more from date of issue, years 1921-1931, inclusive, issues from 1923-1931, inclusive, being classified according to Moody's ratings	4855	4235
X-262—Statement showing all bonds of Bell Telephone System, railroads, public utilities and industrial corporations issued during years 1921-1931, inclusive, in amounts of $5,000,000 and over, maturing in five years or more from date of issue, name of issuing company, amount of issue, interest rate, opening price, high and low resale price and average annual yield	4936	4336a
X-263—Statement re Illinois Bell Telephone Company, Chicago exchange, redistribution of exchange revenues included in intrastate and interstate toll	5004	4342

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X-264 to X-270-B, Inc.—Statements re Illinois Bell Telephone Company, Chicago exchange, station to station separation and apportionment of revenues, expenses and net income, 1923-31	5006	4344
X-270-C—Statement re Ill. Bell Tel. Co., Chicago exchange, capitalized overheads	5015	4353
X-271—Statement re Ill. Bell Tel. Co., Chicago exchange, balance available for return	5016	4354
X-271-A—Statement re Illinois Bell Tel. Co., Chicago division, additional income under attacked rates due to defendants' interstate separation (giving consideration to effective date (October 1, 1923) of Ill. Commerce Commission's order of August 16, 1923) during year 1923	5017	4355
X-272—Statement showing rate of interest on capital stock installments paid by Ill. Bell to A. T. T. converted into average return to stockholders of A. T. & T. on their investments in capital stock of A. T. & T. during years 1920 to 1922, inclusive, and during the years 1923 to 1930, inclusive	5018	4356
X-275—Statement re A. T. & T. Co., percentage of undivided profits allocable to A. T. & T. Co. stock ownership, to investments by A. T. & T. Co. in common stocks to licensee companies, during years 1920 to 1930, inclusive	5019	4357
X-276—Statement re A. T. & T. Co., percentage of undivided profits of licensee companies to investments by A. T. & T. Co. in common stocks of licensee companies, converted into average return to stockholders of A. T. & T. Co. on their investments in capital stock of A. T. & T. Co. during years 1920 to 1930, inclusive	5021	4359
X-277—Statement re A. T. & T. Co., percentage of dividends and undivided profits of licensee companies to investments by A. T. & T. Co. in common stocks of licensee companies, during years 1920 to 1930, inclusive	5023	4361
X-278—Statement re A. T. & T. Co., percentage of dividends and undivided profits of licensee companies to investments by A. T. & T. Co. in common stocks of licensee companies, converted into average return to stockholders of A. T. & T. Co. on their investments in capital stock of A. T. & T. Co. dur-		

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ing years 1920 to 1930, inclusive	5024	4361
X-283—Statement re A. T. & T. Co., dividends on capital stock and undivided profits allocable to A. T. & T. Co. ownership related to investment in capital stock and surplus allocable to A. T. & T. Co. ownership of Ill. Bell Tel. Co., of all licensee companies, and of all licensee companies exclusive of the Ill. Bell Tel. Co. during years 1920 to 1930, inclusive	5025	4362
X-284—Statement re A. T. & T. Co., return on investment (including surplus) in Ill. Bell Tel. Co., in all licensee companies, and in all licensee companies exclusive of Ill. Bell Tel. Co. during years 1920 to 1930, inclusive	5027	4365
X-285—Statement re American Telephone and Telegraph Co., excess of return to A. T. & T. from investment in Illinois Bell Telephone Company over average return from investment in other licensees showing excess of dividends, of interest on loans, of interest on capital stock installments and of undivided profits	5029	4367
X-286—Statement re American Tel. & Tel. Co., percent of undivided profits and dividend payments to capital stock during years 1920 to 1922, inclusive, and during years 1923 to 1930, inclusive	5033	4371
X-287—Statement re American Tel. & Tel. Co., return on funds used in business during years 1920 to 1930, inclusive	5035	4372
X-288—Statement re A. T. & T. Co., summary of capital stock outstanding during years 1920 to 1931, inclusive	5037	4372b
X-289—Statement re A. T. & T. Co., changes in capital stock outstanding since 1922	5038	4373
X-293—Statement re A. T. & T. Co., investments in capital stock of Western Electric from November 17, 1915, to December 31, 1930	5041	4374a
X-294—Statement re A. T. & T. return on investments in capital stock of Western Electric during years 1916 to 1930, inclusive	5042	4375
X-295—Statement re Western Electric Company, return to stockholders on capital investment	5043	4376a
X-296—Statement re A. T. & T. Co., percents of return on investment from all operations, classified during years 1920 to 1922, and during years 1923 to 1930, inclusive	5063	4393
X-297—Statement re A. T. & T. Co., percents of return on capital and surplus from all operations,		

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classified during years 1920 to 1922, and during years 1923 to 1930, inclusive	5065	4395
X 298 Statement re A. T. & T. Co., percent of return on capital stock from all operations, classified during years 1920 to 1922, and during years 1923 to 1930, inclusive	5067	4397
X 299 Statement re A. T. & T. Co., percentages of return of licensee companies on average fixed capital and materials and supplies, years 1920 to 1930, inclusive, and year ended December 31, 1931	5069	4399
X 300 Statement re A. T. & T. Co., percentages of return of licensee companies on average fixed capital and materials and supplies, less average accrued depreciation, years 1920 to 1930, inclusive, and year ended December 31, 1931	5071	4402
X 301 Comparison of revenues, expenses and return on investment in long lines years ended December 31, 1920 to 1922, and during years 1923 to 1930, inclusive	5073	4405
X 302 Statement re A. T. & T. Co., return on fixed capital, including general equipment for Ill. Bell Tel. Co., for all licensee companies, and for all licensee companies exclusive of Illinois Bell Tel. Co., years 1920 to 1922, and years 1923 to 1930, inclusive; also for year 1931	5075	4407
X 303 Statement re A. T. & T. Co., comparison of per cent of return on fixed capital of all licensee companies, as shown in Exhibit No. X 302 and as shown in A. T. & T. Co. monthly statistical report C. R. 51 A, years 1920 to 1930, inclusive, and year 1931	5078	4410
X 304 Statement re A. T. & T. Co., comparison of per cent of return on fixed capital of Ill. Bell Tel. Co. as shown in Exhibit No. X 302 and as shown in Ill. Bell Tel. Co. monthly report No. 1, years 1922 to 1930, inclusive, and year 1931	5079	4410
X-305—Definitions of local exchange service, Southwestern Bell Tel. Co.	5080	4411
X-306—Definitions of local exchange service, Illinois Valley Telephone Co.	5082	4413
X 307—A. T. & T. Co., annual report to stockholders 1931	5089	4420
X-308—A. T. & T. Co., annual report to I. C. C., 1920-1930, inclusive, sheet 210	5104	44310
X-313—Statement re Illinois Bell Tel. Co., Chicago rate case, analysis of sales 1924-1930, to Illinois Bell Tel. Co. and to Bell System		

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of important plant items of Western Electric manufacture	5115	4431
X-313 (A) Statement re Illinois Bell Telephone Company, Chicago rate case, quantities sold to Illinois Bell Telephone Company and to total Bell System 1924 to 1930, graphs	5118	4434
X-314 Illinois Bell Tel. Co., Chicago rate case, percentages charts, representing cross section of purchases from Western Electric Company, Illinois Bell, Bell System, period 1924-1930	5121	4437
X-315 Statement re Illinois Bell Tel. Co., Chicago telephone rate case, Western Electric Co. manufactures sales to all Bell Companies and to Illinois Bell Tel. Co., 1916-1930	5123	4439
X-315 (A) Statement re Illinois Bell Tel. Co., Chicago telephone rate case, Western Electric Co. manufactures sales to Bell customers and to Ohio Bell Tel. Co., 1922-1930	5124	4439
X-316 Statement re Illinois Bell Tel. Co., Chicago telephone rate case, Western Electric Company manufactures, 1922-1930, sales to Ill. Bell and to Ohio Bell as percent of total sales to Bell customers	5125	4440
X-317 Statement re Ill. Bell Tel. Co., Chicago rate case, analysis of estimated quantities of materials of various classes for each associated company to be delivered by Western Electric Co., from provisional estimates, period 1922-1932	5126	4440
X-317 (A) Statement re Ill. Bell Tel. Co., Chicago rate case, cross section of estimated quantities of materials to be delivered by W. E. Co. to each associated Co., period 1922-1932, 11 years, quantitites from provisional estimates	5137	4441
X-319 Statement re Illinois Bell Tel. Co., Chicago rate case, analysis of estimated quantities of materials, panel central office equipment step-by-step lines private branch exchanges. To be delivered by Western Electric Co. to each associated Co. from provisional estimates, period 1932-1934	5140	4443
X-320—Illinois Bell Tel. Co., Chicago rate case, depreciation data from provisional estimates percent retirements, depreciation rates	5343	4444b
X-321—Statement re Illinois Bell Tel. Co., Chicago rate case, relative size of Bell System and independent Tel. Co. groups	5147	4449

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X 322	Statement re Illinois Bell Tel. Co., Chicago division, analysis of account 510, message tolls; account 512, leased toll lines; account 514, telegraph service on toll lines, and account 516, other toll lines revenues, January 1, 1923, to December 31, 1930.....	5149	4450a
X 323	Statement re Illinois Bell Tel. Co., Montclare office, manual and panel switching equipment, comparative cost study.....	5152	4451
X 324	Cost study central office equipment (Edgewater area), correspondence relating thereto	5153	4451
X 325	Examples 1 and 2, depreciation studies (Turner method).....	5154	4452
X 326	Example 3, depreciation study (Turner method)	5156	4453
X 327	List of exchanges in Illinois shown in Exhibit A 68.....	5157	4454
X 328	Statement re Illinois Bell Tel. Co., Chicago division, comparison of revenues and expenses and return on average fixed capital and materials and supplies, less accrued depreciation, years 1923 to 1931, inclusive; also Chicago division intrastate 1923-1930, inclusive, and Chicago division intrastate exchange 1923-1930, inclusive.....	5158	4455
X 331	Statement re Illinois Bell Tel. Co., Chicago division intrastate, return on average fixed capital and materials and supplies, less average accrued depreciation, in excess of the average return of all licensee companies of A. T. & T. during years 1923-1930, inclusive; same for other licensee companies 1923-1930, inclusive.....	5162	4456B
X-332	Statement re Illinois Bell Tel. Co., Chicago division intrastate exchange, return on average fixed capital and materials and supplies, less average accrued depreciation, in excess of the average return of all licensee companies of A. T. & T. during years 1923 to 1930, inclusive; same for other licensee companies 1923-1930, inclusive	5164	4456D
X-334	Statement re Illinois Bell Tel. Co., Chicago division, return on average fixed capital and materials and supplies, less average accrued depreciation in excess of the average return of all licensee companies of A. T. & T. Co. during year 1931; same for other licensee companies.....	5166	4456E

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X 335	Statement showing average cost of funds used in business eight years 1923-1930....	5168	4457
X 336	Illinois Bell Tel. Co., Statement of Chicago division, Chicago division infrastate and Chicago division intrastate exchange showing net income required to cover all interest, amortization of bond discount and expense, and an 8% dividend together with resultant rates of return on the plaintiff's showing of average reproduction cost and average book cost including materials and supplies and cash working capital during years 1923-1930, inclusive.....	5172	4462
X 337	Illinois Bell Telephone Company, Chicago division, statement showing the net earnings per share available for the stockholders of the Illinois Bell Tel. Co. and the average earnings available for A. T. & T. stockholders on their proportionate investment in capital stock of A. T. & T. which would result from varying rates of return on the plaintiff's showing of average book cost including materials and supplies and cash working capital during years 1923-1930, inclusive; same for average reproduction cost.....	5173	4462
X 338	Illinois Bell Tel. Co., Chicago division, Plaintiff's Exhibit A-53 adjusted for rate base of book cost of plant, less depreciation, etc., years 1921-1933, inclusive....	5177	4462c
X-340	Illinois Bell Tel. Co., Chicago division, Plaintiff's Exhibit A-53 adjusted for net income available for return under rates in suit and for rate base during years 1923 to 1931, inclusive; same for Chicago division intrastate and for Chicago division intrastate exchange, years 1923-1930, inclusive.....	5178	4462d
X-342	Interstate Commerce Commission, uniform system of accounts for telephone companies, January 1, 1913.....	5179	4463
X-343	Response to Mr. Blackman's question to Mr. Hammond on cross-examination. (Record 5518).....	5190	4776
X-346	Order of November 29, 1919, on petition, Illinois Public Utilities Commission, X-431.	5191	4476
X-347	Petition of May 21, 1920, in case No. 9291..	5200	4483
X-348	Mr. Crunden's working papers used in connection with his Exhibit A-100.....	5219	4499

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X-349—Exhibits furnished by Mr. Heiss in connection with Heiss Ohio Exhibit No. 10, bearing the legends "Classification of Departmental Expenses" for the years 1920-1930, and "Analysis of Departmental Expenses, Year 1931."	5225	4501
X-351—Heiss Ohio Exhibit No. 11 furnished by plaintiff	5239	4505
X-352—Annual reports of Illinois Bell 1920-1931, inclusive	5240	4506
X-353—Annual reports of Western Electric Co., Illinois Corporation, 1909-1915, inclusive, and of New York Corporation, 1916-1931, inclusive	5253	4513
X-354—Portions of provisional estimates of Illinois Bell and letters of transmittal 1920-1931, inclusive	5361a	4588
X-355—Portions of provisional estimates of other licensee companies 1920-1930	5385	4591
X-356—Agreement, dated June 19, 1919, between International Telephone Sales and Engineering Corporation and Western Electric Co., Inc. (New York corporation)	5387	4593
X-357—Copy of agreement, dated March 21, 1924, between Theodore Gary, Frank H. Woods, H. L. Gary and A. F. Adams, and Western Electric Company, Inc. (New York corporation)	5394	4597
X-358—Correspondence between Western Electric and Automatic Electric, Inc.	5397	4599
X-359—Copy of agreement dated March 26, 1921, between International Telephone Sales & Engineering Corporation and Western Electric Company, Inc. (New York Corporation)	5408	4609
X-360—Memorandum regarding letter of May 26, 1927, from Electrical Research Products, Inc., to H. L. Gary	5409	4609
X-361—Letter, dated May 26, 1927, from International Telephone Sales & Engineering Corporation to Electrical Research Products, Inc.	5410	4610
X-362—Assignment, dated October 13, 1927, from International Telephone Sales & Engineering Corporation to Automatic Electric, Inc.	5413	4612
X-363—Agreement, dated March 21, 1924, between International Telephone Sales & Engineering Corporation and Western Electric Company, Inc.	5414	4613

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X-364—Agreement between International Telephone Sales & Engineering Corporation and Western Electric Co., Inc., dated May 24, 1927	5422	4617
X-365—Advertisements of A. T. & T., the cost of which was charged by the plaintiff as part of the costs of rendering the license contract services:		
"What is the A. T. & T.?", No. 268, February, 1931	5429	4625
"The Bell Telephone Company of Your Town," No. 258, April 1930	5429	4626
"Where Working Together is Everything," No. 242, December, 1928	5430	4627
"5,000 People Whose Sole Job is Bettering Your Service," No. 240, October, 1928	5431	4627
"Building on the Telephone Principle," No. 216, October, 1926	5432	4628
"Where the Bell System's Profit Goes," No. 239, September, 1928	5433	4629
"A Reduction in Long Distance Telephone Rates," No. 255, January, 1930.	5434	4630
"How Many are 421,000 Stockholders?", No. 230, December, 1927	5435	4631
X-367—Statement showing net profits on new A. T. & T. instruments, 1927	5436	4631
X-368—Statement entitled: "Western Electric Company, Inc., number of shares of A. T. & T. Company stock on which payments were completed by Western Electric Company employees"	5439	4633
X-369—Statement showing A. T. & T. releases 7/15/19 to 11/2/31	5441	4634
X-370—Statement showing royalties received by Western Electric Company, Electrical Research Products, Inc., and portion paid to A. T. & T. Company in accordance with releases	5445	4637
X-371—Statement re American Telephone and Telegraph Company, miscellaneous non-operating revenues (account 316), year 1931	5448	4640
X-373—Handbook of outside plant engineering practices, general, of A. T. & T. and associated companies	5449	4640
X-374—Memorandum of agreement dated February 16, 1922, between Western Electric Co., Inc. (New York Corporation), and Stromberg-Carlson Telephone Manufacturing Co.,		

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	covering manufacture of inter-communicating telephone apparatus	5464	4659
X 375	Memorandum of agreement dated June 1, 1920, between Stromberg-Carlson Telephone Manufacturing Co., and the Western Electric Company, Inc. (New York Corporation)	5466	4662
X 378	Agreement between Western Electric Co., Inc., and International Standard Electric Corp., dated March 30, 1928	5469	4664
X-379	Memorandum of agreement dated January 1, 1919, between International Western Electric Co., Inc. and Northern Electric Co., Limited	5480	4675
X 380	Memorandum of Agreement dated Aug. 27, 1919, between International Western Electric Co., Inc. and Western Electric Co., Limited, Northern Electric Co., Limited, and the Bell Telephone Company of Canada, Limited	5483	4679
X 381	Supplemental patent agreement, American Telephone & Telegraph Co., Western Electric Co., Inc., International Western Electric Co., Inc., Northern Electric Co., Ltd., The Bell Telephone Co., of Canada, Ltd., dated May 16, 1923	5488	4681
X-382	Assignment from International Western Electric Co., Inc., to Western Electric Co., Inc. (New York Corporation) of its rights in connection with agreement between Assignor and Northern Electric Co., Ltd., dated January 1, 1919, which assignment is dated Sept. 30, 1925	5494	4689
X 383	Agreement between Western Electric Co., Inc., and Victor Talking Machine Co., Inc. dated June 26, 1925	5495	4690
X-385	Agreement between Western Electric Co., Inc., and Victor Talking Machine Co., Inc., dated March 18, 1925	5508	4701
X-386	Agreement between International Western Electric Co., Inc., and Victor Talking Machine Co., dated May 1, 1925	5515	4708
X-388	Memorandum of agreement between Victor Phonograph Co. and Electrical Research Products, Inc., dated January 11, 1928	5523	4715
X-390	Agreement between International Western Electric Co., Inc. and Columbia Graphophone Co., Ltd., dated April 22, 1925	5527	4719
X-391	Agreement between International Western Electric Co., Inc. and The Gramophone Co., Ltd., dated May 1, 1925	5534	4726

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X 392	Agreement between Western Electric Co., Inc. and The Gramophone Co., Ltd., dated Jan. 19, 1926	5543	4733
X 393	Agreement between Electrical Research Products, Inc. and The Gramophone Co., Ltd., dated Aug. 10, 1927	5553	4741
X 394	Agreement for Western Electric Sound System, Plan B2 N. D. P. 52W between Electrical Research Products, Inc. (subsidiary of Western Electric Company) etc. (Form 315TS)	5563	4749
X 395	Agreement between American Telephone and Telegraph Co. and the Bell Telephone Company of Canada, Ltd., covering Services, Licenses and Privileges, dated May 16, 1923	5564	4750
X 396	Copy of General Contract, agreement dated Nov. 1, 1880, between The Canadian Telephone Company, Ltd., and The American Bell Telephone Company, The Bell Telephone Company of Canada, the American Speaking Telephone Company, The Gold and Stock Telegraph Company and The Western Union Telegraph Company	5570	4756
X 397	Certified copy of resolution adopted by Executive Committee of A. T. & T. at meeting Jan. 15, 1924; certified copy resolution adopted at meeting January 7, 1925; certified copy resolution adopted at meeting January 13, 1926; certified copy resolution adopted at meeting Jan. 12, 1927; and certified copy resolution adopted at meeting January 18, 1928	5574	4760
X 398	Statement re Electrical Research Products, Inc., General Auditing Dept., Results of Talking Motion Year 1930	5576	4761
X 400	Supplement to City's Exhibits furnished by plaintiff	5587	4771
	44—Illinois Bell Telephone Company—Distribution of Chicago Gross A. T. & T. Company Tolls between Illinois Bell Tel. Co. and A. T. & T.—1926-1930 1931	5587	4771
	53—Agreement in connection with Employee's Stock Plan—dated June 10, 1921, between A. T. & T. and Illinois Bell Tel. Co. 1931	5589	4772
	54—Illinois Bell Telephone Company—Payments made to A. T. & T. covering collections under the Employee's Stock Plan 1931	5596	4778

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57—Illinois Bell Telephone Company—Purchases from Western Electric Company.....1931	5597	4779
76—Illinois Bell Telephone Company, Advances from A. T. & T. during years 1926 to 1930.....1931	5599	4781
80—Illinois Bell Telephone Company, balance sheets, years 1926 to 1930 1931	5607	4792
81—Illinois Bell Telephone Company, dividends 1926 to 1930.....1931	5610	4796
82—Illinois Bell Telephone Company, Entire Company, Net Earnings Available for Interest and Dividends 1931	5610	4796
117—Illinois Bell Telephone Company, Chicago Exchange, amount of billing to the A. T. & T. for operating the toll properties devoted to long lines service in Chicago—1926-1930 1931	5611	4796
142A—A. T. & T. Co., amounts received from all Associated Bell Companies for License Payments during the years 1918-1928, answer to question p. 2044 Trans. of Record..1931	5613	4799
142C—A. T. & T., Illinois Bell Telephone Company estimated requirements and cash taken, years 1918 to 1928—Recheck of Testimony, pp. 2110-2112, Trans. of Record p. 2135 1931	5614	4800
148—Supplemental answer to question pp. 2047 and 2059, Trans. of Rec.—A. T. & T.—Cost of Capital Funds Procured by the American Company through Sale of Stock, Bonds and other Borrowings.....1931	5614	4800
151—Illinois Bell Telephone Co.—Total Number of Employees, Number of Employees Eligible to Subscribe, Number of Shares of A. T. & T. Stock issued to Employees during year, Number of shares A. T. & T. Stock under Subscription end of Year and % of Total Employees subscribing 1931	5615	4800
X-402—Correspondence between counsel and parties	5616	4801
X-403—Ruskin's statement of number of pages in CR and MR Reports furnished by plaintiff at later date	5618	4802

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X-404—Balance sheets of Graybar Electric Co. for years 1929, 1930 and 1931, with certificate of Assistant Secretary attached. (These were delivered to defendants by Mr. Thompson in open court on June 15, 1932.)	5619	4802
X-405—Statement entitled: "a/c Profit on Investment in Business with Illinois Bell 1916-1931 and 1923-1931. (This is working paper for Exhibit A-93 to 96 and was furnished by plaintiff)	5620	4802A
X-406—Burgess Index Numbers:	5621	4803
X-408—Statement re Illinois Bell Tel. Co.—Chicago Area—Book Cost of Central Office Telephone Equipment	5631	4810
X-409—Statement re Illinois Bell Tel. Co.—Chicago Exchange—Company Stations	5632	4812
X-410—Statement re Illinois Bell Tel. Co.—Chicago Exchange—Figures used in arriving at average assets for 1923	5633	4812
X-415—Statement re Illinois Bell Tel Co.—Chicago Exchange—Public Pay Stations	5634	4813
X-416—Advice No. 40, dated July 15, 1919, to Public Utilities Commission, Springfield, Ill., with accompanying schedules issued by Chicago Telephone Company, etc. Attached petition with Exhibit A	5635	4813
X-418—Statement re Illinois Bell Tel. Co.—Stock Purchased by A. T. & T.—Years 1929 to 1931, incl.	5645	4815
X-419—Statement re Illinois Bell Tel. Co.—Prices at which A. T. & T. stock offered to employees	5645	4816
X-420—Executive Committee Minutes and Documents called for therein	5647	4816
Agreement of June 13, 1923, between Morkrum Company, Western Electric Company, Inc., and American Telephone & Telegraph Company	5681	4841
Letter of August 14, 1925, to Western Electric Company, Inc., signed by W. S. Gifford, President of American Telephone & Telegraph Co.	5685	4845
Agreement of October 6, 1925, between Automatic Electric Company, American Telephone and Telegraph Company and Western Electric Company, Inc.	5687	4847
License Agreement of July 17, 1928, between Stromberg-Carlson Telephone Manufacturing Company, Western Electric Company, and American Telephone and Telegraph Company	5691	4850

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Letter of June 12, 1928, to W. S. Gifford, President of American Telephone & Telegraph Co. signed by Edgar S. Bloom, President of Western Electric	5694	4852
Agreement of September 11, 1930, between American Telephone & Telegraph Company and Sterling Morton	5704	4859
Contract of May 24, 1927, whereby American Telephone & Telegraph Company extended franchise agreement with Automatic to 1936.....	5712	4868
X-421—Western Electric Sheets furnished in connection with Gregory Exhibits 1 and 7 in Ohio Case	5715	4869
X-422—Stock Issue Data, 1920-1931, for A. T. & T. Co.	5746	4892
X-423—Statement showing Approximate Sales of Panel and Step-by-Step Machine Switching Switchboards, 1920-1931, Inclusive (A); also Approximate Number of Lines of Panel and Step-by-Step Machine Switching Switchboards, 1918-1931, inclusive	5747	4893
X-424—Memorandum of proposed agreement between American Telephone and Telegraph Co. and Central Union Telephone Company, dated New York Feb. 15, 1924..	5749	4894
X-426—Contracts, Schedules, Filings and Documents of Illinois Bell Telephone Company relating to Exchange and Toll Services in Chicago Area, effective during period 1923-1931, both inclusive	5751	4895
X-427—Pursuant to request of Defendants, plaintiff, on June 19, 1932, furnished copies of all contracts that ever existed in the Bell System containing a provision similar to Section 10 of the contract of Dec. 23, 1881, with the Chicago Telephone Company, being City's Exhibit 23. The plaintiff has furnished two contracts as being the only ones ever made containing provisions similar to Section 10.		
Agreement dated June 1, 1880, by and between the American Bell Telephone Co. and the Metropolitan Telephone Company;	5786	4925
Agreement dated May 7, 1880, between the National Bell Telephone Co. and the Pacific Bell Telephone Co.	5789	4982
X-429—Order of July 31, 1919, in connection with petition X-416. I. P. U. C.....	5794	4931

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X-430—I. P. U. C. No. 2—Chicago Telephone Company—Schedule of Total Rates, filed July 16, 1919, in Case #9291	5802	4937
X-431—Petition of November 15, 1919, in Cases 8672 and 9291, I. P. U. C.	5804	4939
X-432—Illinois Bell Tel. Co.—Data relative to stock issues, 1920-1930	5805	4940
X-433—Letter dated August 26, 1927, to Telephone Company Presidents re prices on approximately 50 classes of telephone apparatus	5806	4941
X-434—Letter dated Oct. 17, 1930, to Frederick H. Reid, President of Mountain States Telephone & Telegraph Co., from Edgar S. Bloom with sheet attached entitled: "Important Price Increases effective Nov. 1, 1930."	5809	4942
X-435—MR and CR Reports	5812	4944a
X-436—Summary Sheets of Turner's Rebuttal Depreciation Study	5818	4949
X-437—Turner's Working Papers	5829	4956
X-438—Statement re A. T. & T. Co.—Use of Conversion formula in Connection with return on Entire Company Stock in Comparison with return on that portion of Stock represented by Investment in Stock of Illinois Bell	5831	4957
X-439—Letter of June 29, 1932—Mr. Goldstein to Mr. Blackman	5834	4959
Record from district court of the United States, Northern Illinois, on cross-appeal	5835	4961
Caption (omitted in printing)	5835	
Petition for appeal	5837	4961
Assignments of error	5840	4962
Order allowing appeal	5852	4969
Bond on appeal (omitted in printing)	5854	
Stipulation for additional and supplemental statement of evidence	5858	4970
Order approving additional and supplemental statement of evidence	5862	4972
Additional and supplemental statement of evidence	5864	4973
Motion for rule requiring plaintiff to make available certain data, etc	5864	4973
Exhibit X-106—Statement showing allocation of taxes, 1923-1930, A. T. & T. Co.	5866	4974
Exhibit X-107—Statement as to instrument maintenance, 1923-1927, A. T. & T. Co.	5880	4986
Exhibit X-113—A. T. & T. Co., Percent of return on investment in telephone instruments used by Illinois Bell Tel. Co., Chicago division, if total return is reduced by amount of taxes on instruments during years 1923 to 1927, inclusive	5881	4987

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Exhibit X-114—A. T. & T. Co., Percent of return on investment in telephone instruments used by associated companies per Exhibit A-198 "Fair Allowance for Telephone Instruments. Exhibit A-202, less costs shown in Exhibit A-170," years 1923-1927	5882	4988
Exhibit X-115—A. T. & T. Co., Comparison of claims of plaintiff for return on investment in telephone instruments used by Ill. Bell T. Co., Chicago division, with A. T. & T. Co.'s actual experience for year ended December 31, 1923	5883	4989
Exhibit X-116—A. T. & T. Co., Cost of furnishing telephone instruments to Chicago division of Illinois Bell Telephone Company, year 1920	5884	4990
Exhibit X-117—A. T. & T. Co., Profit on furnishing telephone instruments to Chicago division of Illinois Bell Telephone Company, year ended December 31, 1920	5885	4990
Exhibit X-118—A. T. & T. Co., Percent of return on investment from furnishing telephone instruments to Chicago division of Illinois Bell Telephone Company on basis of annual allowance of $1.13 per telephone station made by Public Utilities Commission in order of December 20, 1920, during year ended December 31, 1920	5886	4991
Exhibit X-119—A. T. & T. Co., Percent of excess of average current cost of telephone instruments used by Illinois Bell Telephone Company, Chicago division, shown by Plaintiff's Exhibit A-163 over book cost computed from Plaintiff's Exhibit A-166, during years 1923 to 1927, inclusive	5887	4992
X-120—A. T. & T. Co., Percent of excess of average current cost of telephone instruments used by Bell System shown by Defendants' Exhibit 122 over book cost shown by Plaintiff's Exhibit A-166, during years 1923 to 1927, inclusive	5888	5993
Exhibit X-124—Capital stock holdings in licensee companies showing dividend rates and yields thereon during years 1920, 1921, and 1922, and from 1923 to 1930, inclusive	5889	4994
Exhibit A-127—Average return to A. T. & T. from dividends on its investments in capital stocks of licensee companies converted into average return to stockholders of A. T. & T. on their investments in capital stock of A. T. & T. during years 1920 to 1922, and during years 1923 to 1930, inclusive	5898	4999
Exhibit X-128—Profit on investment in capital stocks of licensee companies during years 1920 to 1922, and during years 1923 to 1930, inclusive	5900	5002

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Exhibit X-136—Percentage relationships of average investments in capital stocks of licensee companies and in loans to licensee companiee to total average investments (stocks and loans) in licensee companies, years ended December 31, 1920, to 1922, and 1923 to 1930, inclusive.....	5908	5009
Exhibit X-146—American Tel & Tel. Co., Return from license contract operations with Ill. Bell Tel. Co. in excess of the average return from license contract operations with other licensee companies during years 1920 to 1922, and during years 1923 to 1927, inclusive.....	5912	5013
Exhibit X-147—A. T. & T. Co., Return from license contract operations under present rates and under attacked rates with Illinois Bell Tel. Co., Chicago division, in excess of the average return from license contract operations with other licensee companies, during years 1923 to 1930, inclusive	5915	5016
Exhibit X-152—Composite of estimated requirements, plant investment and gross additions, etc., 1923-1931, A. T. & T. Co.....	5916	5017
Exhibit X-219—Statement showing average number of stations in service, etc., 1923-1930.....	5918	5018A
Exhibit X-323—Illinois Bell Tel. Co., Montclare office, Manual and panel switching equipment, comparative cost study.....	5919	5018B
Exhibit X-324—Cost study central office equipment (Edgewater area), correspondence relating thereto	5926	5021
Exhibit X-352—Annual reports of Illinois Bell, 1920-1931, inclusive.....	5931	5025
Exhibit X-354—Portions of provisional estimates of Illinois Bell and letters of transmittal, 1920-1931, inclusive	5932	5024
Exhibit X-366—Statement showing net profits on telephone instruments, 1916-1925.....	5939	5026D
Exhibit X-376—Correspondence between Western Electric and Kellogg Switchboard & Supply Company	5941	5028
Exhibit X-402—Correspondence between counsel and parties.....	5949	5033
Exhibit X-420—Executive committee minutes and documents called for therein.....	5963	5048
Exhibit D-20—Analysis of cost of sales of telephone apparatus to Bell customers, 1916-1930, inclusive.	5977	5055
Exhibit D-21—Analysis of cost of sales of lead covered cable to Bell customers, 1916-1930, inclusive.	5798	5056
Exhibit D-23—Analysis of cost of sales of Western Electric manufacturers to non-Bell customers, 1916-1930, inclusive.....	5979	5057

	Original	Print
Exhibit D-107—Letter dated November 14, 1923, to W. S. Gifford, executive vice-president A. T. & T., transmitting five copies of 1924 provisional estimates	5980	5058
Exhibit D-113—CR-13 reports, 1913-1931	5982	5058A
Deposition Exhibit 38—Excerpts from Bell System Technical Journal	6000	5059
Exhibit A-32—Statement showing per cent condition of station apparatus, etc	6001	5060
Stipulation as to transcript of record	6004	5062
Clerk's certificate (omitted in printing)	6006	
Citation and service (omitted in printing)	6007	
Statement of points to be relied upon and designation of parts of record to be printed	6010	5063
Designation by appellees of additional parts of record to be printed	6016	5066

IN THE

District Court of the United States

FOR THE NORTHERN DISTRICT OF ILLINOIS,

EASTERN DIVISION.

ILLINOIS BELL TELEPHONE COMPANY,
Plaintiff,

vs.

G. GALE GILBERT, J. PAUL KUHN, WALTER H. WILSON, WILLIAM M. BRINKMAN, PHIL W. COLLINS and PAUL SAMUELL, the persons constituting the Illinois Commerce Commission of the State of Illinois, and OSCAR E. CARLSTROM, Attorney General of the State of Illinois,
Defendants,

and

CITY OF CHICAGO, a municipal corporation,
Intervenor.

In Equity
No. 3746.

Heard before
Hon. Evan A. Evans
Hon. George T. Page
Circuit Judges
and
Hon. James H. Wilkerson
District Judge.

ABSTRACT OF RECORD

Plaintiff's Evidence

Volume I—(Pages 1 to 308)

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3 The Court convened at 10 o'clock A. M. on Tuesday, the 23d day of February, 1932.

Present:

Hon. George T. Page, Circuit Judge, Presiding

Hon. James H. Wilkerson, District Judge.

Judge Page: Gentlemen, it has been thought that the practical thing to do is that which was done before: have the evidence heard by Judge Wilkerson sitting alone, if that is satisfactory to the parties, and then the matter be taken up by the three Judges after the evidence is in.

Mr. Haight: That is agreeable to the defendants, if the Court please.

Judge Page: Is that agreeable to the other side?

Mr. Bracelen: Yes, your Honor.

It was agreed by counsel, pursuant to the Court's suggestion, that the evidence to be offered pursuant to the Supreme Court's mandate dated December 26, 1930, should be presented and offered by the parties before Judge Wilkerson without requiring the presence at all times or at any time of any or all of the other Judges, members of the Court specially constituted for the trial of this case, under and pursuant to the same stipulations, agreements and arrangements under which the evidence was similarly presented and offered on the original hearings.

Judge Wilkerson: The evidence in this case should be abstracted as we go along with the testimony, as rapidly as possible, and copies of the abstract and exhibits can then go to Judge Evans and Judge Page, who will then have the same benefit of the record up to the point where they are able to participate in the hearing as if they had actually heard the testimony. So, if you will have that in mind and arrange the abstract and the exhibits from time to time so that they will be kept up to date with the proceedings here, I think it will serve very greatly to expedite the disposition of the case.

Mr. Haight: The parties had so arranged, prior to this session, this morning.

OPENING STATEMENT ON BEHALF OF PLAINTIFF

4 Mr. Bracelen: If the Court please, it has seemed to us that it might be helpful to make a short opening statement giving in broad outline the character and scope of the testimony that the plaintiff intends to offer. Under the decision of the Supreme Court, it is incumbent upon the

5 plaintiff to show for each of the nine years now involved in the case, the fair value of the property, the fair rate of return, and what the earnings of the Company would have been under the rates prescribed by the Commission, with respect to the intrastate portion only of the plaintiff's business in the City of Chicago.

Our proof will be addressed, first, to the first of those issues, the fair value of the property. It will be of the same character as that which was introduced by the plaintiff upon the former trial. The actual cost to the plaintiff of its property for each of the years will be shown, of course, and the estimated cost of reproducing the property new, under the conditions prevailing as of each of the nine years. Mr. Sloan, who was the witness upon that branch of the case on the former trial, is the witness at this trial. He will testify that the methods by which he has arrived at the estimated cost of reproduction new, are the same, with one or two very minor modifications, as those which he employed before. I speak of that because it occurs to us that that being so, probably Mr. Sloan's testimony will be very much shorter than would otherwise be necessary, certainly shorter in so far as direct examination is concerned.

6 The depreciation existing in the property as of each of the years will be shown in evidence, and again, the methods employed are the same as those employed before, and that evidence will be summed up as the Commission itself summed it up, and as the Court did at the former trial, in terms of so-called per cent condition. That per cent condition being applied then to the estimated cost of reproduction new, year by year, will give the so-called reproduction cost new, depreciated, as important and more or less controlling evidence of the fair value of the property. In connection with this depreciation testimony, your Honors will recall that the results of an inspection of the property made in 1923 were put in evidence at the former trial. Another much more extensive and complete inspection of the property has been made in preparation for this trial.

That inspection was made in the early months of 1931, made by officials of the Company expert in the several classes of property involved, and by men who have in the regular course of their duties in maintaining and operating the property throughout this entire period, been familiar with its condition at all times, both its physical condition
7 and its functional condition. These men, having acquainted themselves with the inspection made in 1923, and having now made this very thorough inspection in 1931, being familiar with the maintenance of the property in the intervening years, will testify to the condition of the property, and the amount of depreciation existing in it for each of the years separately.

Then, of course, it becomes necessary under the decision of the Supreme Court to make a separation or segregation of the property as between its use in intrastate service and its use in interstate service, since, broadly speaking, the entire property is devoted to both classes of service at all times.

The valuation evidence, the character of which I have described, then deals with the property as a whole; the inspection deals with the property as a whole; and the separation factor, or factors, are applied to make the segregation as between that part of the property which is involved in the case of the intrastate property, and that which is excluded as not within the jurisdiction of the State Commission, and not within the issues. This separation is not different from that which was made before, in so far as the two overlap, but your Honors will have it in mind that the Supreme Court
8 has now held that the portion of the property which was treated as exchange property solely, though involved in interstate and other toll use, must be separated upon the basis of the relative use.

Stating that somewhat more specifically, the telephone instrument upon the subscriber's premises, the lines connecting with the central office, and the central office itself—all of these

elements of property that are involved in every local call within the Chicago exchange, are of course utilized in connection with every toll call. The rates for local telephone service, or perhaps it would be more accurate to say, the charges made for local telephone service, have always covered this toll use, both intrastate toll and interstate toll use, and compensated for it so that the telephone subscriber receives as a part of the service for which he pays the regular monthly local rate, access to the toll board. The toll rates, including those for interstate service, whether of the American Telephone & Telegraph Company or of the Illinois Bell Telephone Company, have been based upon the use of the toll property only.

Now, in making the separation of the property, the facts that I have been discussing in reference to the distribu-
9 tion of the charges as between local service and toll service have no bearing upon the problem, but we come immediately following our valuation testimony to the matter of revenues, expenses and net earnings, and there the same situation exists. The earnings in total are shown. Of course, the books in this case report the toll earnings and, separately, the intrastate and interstate toll earnings, and the local earnings as such; so that there is no problem involved in identifying those three categories of earnings. But in view of the separation of the property now to be made, it of course becomes necessary to determine that portion of the charges for local service which compensate the Company for the use of the local property in connection with the toll service, and a segregation there is made of the so-called exchange revenues, upon the basis of use. A segregation of the expenses is made, and when our proof shall have been completed to that point, the record will show the value of the property devoted to the intrastate service, the over-all earnings derived from that service, the expenses attributable to it, and the net.

Perhaps I ought to say that, as upon the former trial, so upon this trial, the property separation is made in such

10 manner as to show separately the exchange property, all of which is intrastate in character because the exchange service is purely local business; the toll property, devoted to the intrastate toll service, and the toll property separately, devoted to the interstate service.

We will show the effect of the reductions in the rates that are sought to be enjoined. Those rates have never been in effect, and their effect will be shown by the same kind of evidence that was introduced before. Of course, the effect of the reductions made by the Commission is not a constant amount, both because of more or less shifting in the classes of service, and also because of the growth and extension of the business; but very broadly speaking, your Honors will recall that the reduced rates, had they been in effect, would have reduced the Company's revenue by an amount on the order of $1,500,000. It runs considerably higher than that in some years, and possibly slightly lower than that in one or two years. The facts precisely in that respect I do not have in mind, and it is not important that we have them in mind now.

Ordinarily, the evidence that I have now outlined
11 would cover all of the issues, the ultimate issues, in a case of this character, but there are other collateral issues which must be tried in accordance with the decision of the Supreme Court. These relate to the matter of the profits of the Western Electric Company, first; second, the cost to the American Telephone & Telegraph Company of rendering the services to the operating companies of the Bell System and to the Illinois Bell Telephone Company under what is known as the license contract; and third, the depreciation expense. May I just say a few words about each of these branches of the case?

The evidence upon the former trial adduced upon cross-examination showed that the Western Electric Company had realized a profit of 7 per cent on its investment over a period extending from 1916, when the present Western Electric Company was organized, down to and including the year 1928,

that being the latest year available at the former hearing. That evidence further showed that that Company had not earned in excess of 10 per cent in any one year. This Court in its opinion referred to those facts, and the Supreme Court does so in the opinion of Mr. Chief Justice Hughes.

12 The evidence also established the fact that the prices of the Western Electric Company for its products, consisting of telephone apparatus and equipment manufactured by it, were lower, very much lower, to the operating telephone companies of the Bell System, than its prices to outside customers, telephone companies outside the Bell System, and very much lower than the prices of other manufacturers of similar apparatus and equipment. That testimony, of course, was introduced to establish the reasonableness of the Western Electric Company's prices. The Supreme Court in its opinion refers to that testimony and recognizes expressly that it is important, but that Court holds that it is incumbent upon the Telephone Company in this case to show for each of the years the profits made by the Western Electric Company upon that portion of its business done with the companies of the Bell System, and then to relate that over-all showing to the particular area, the Chicago exchange, involved in this case.

The evidence will show that the prices of the Western Electric Company upon its business outside of the Bell System, which were reflected in the 7 per cent average of profits that I referred to a moment ago, have been substantially higher upon that business than the Western Electric

13 Company's profits upon its business done with the Bell System companies, so that in so far as the profit realized by the Western Electric Company tends to establish the reasonableness or unreasonableness of the prices charged by the Western Electric Company, this evidence is more favorable in support of the reasonableness of those prices than was the over-all showing upon the former trial. That, however, is scarcely noticeable in the rate per cent of profit, for the reason that the volume of business done by the Western Electric Company with outside telephone companies is a mere

bagatelle, as compared with the volume of its business in the sales of telephone apparatus, equipment and supplies to the companies of the Bell System. That is to say, that while the Western Electric Company charges substantially higher prices for its goods to companies outside of the Bell System, and presumably makes substantially higher profits, and in fact, makes substantially higher profits upon that business, as shown by this evidence, than it does upon similar business done with the companies of the Bell System, the volumes are such that you can scarcely find the effect in the figures. The issue to which the evidence of the profits of the Western
14 Electric Company on its Bell System business is directed, is, of course, the issue of the reasonableness of the Western Electric Company's prices to the Bell System companies. That is an important inquiry in the case, and was so recognized at the former trial, for the reason that the Illinois Bell Telephone Company, like all of the operating telephone companies of the Bell System, purchases substantially all of its plant and much the greater part of its supplies from the Western Electric Company. Those prices have a bearing upon the determination of the fair value of the property, because those prices are reflected in the cost of the property, which will be shown in evidence; they are the prices employed in arriving at the reproduction cost new of the property; and to some extent, although to rather a minor extent, they have a bearing upon the expenses of the Company from year to year, since materials and supplies used in the maintenance and repair of the plant, as distinguished from additions of a permanent nature, are also purchased from the Western Electric Company. The evidence upon this branch of the case will, we think, show that the Western Electric Company passes on to the operating companies and to this plaintiff, the advantages which inhere to the Western
15 Electric Company in its situation in relation to the Bell System as a whole. It would, I think, be proper to refer to that in this opening statement in any event, but I refer to it especially because of the fact that the Chief Justice in his

opinion makes express reference to it. He points out in that opinion that the Western Electric Company has this assured market; the Bell System companies buy practically all of their requirements, which in the aggregate are very large, from the companies' own manufacturing company, sometimes referred to, and referred to by the Supreme Court in the opinion, as the Manufacturing Department of the Bell System. It has in addition to this large and assured market, the advantage of the high credit of the companies of the Bell System, with the result that there are no bad accounts, such as a manufacturer ordinarily would have to cover in his prices if he were to have a reasonable profit from his operations.

The third advantage mentioned by the Supreme Court is the fact—which appeared at the former trial and is still true, as the evidence will show—that the telephone companies of the Bell System plan a reasonable way ahead for their
16 construction, and schedule their requirements, and those requirements—provisional estimates, as they are called—are made known to the Western Electric Company. It is therefore in the position of knowing within limits what its volume of business is going to be for the succeeding year. And those advantages, I say, the evidence will show are passed on to the operating companies. They are reflected in the low prices charged by the Western Electric Company, and they are reflected in the very moderate rate of profit which the Western Electric Company makes on its business with the companies of the Bell System.

The next of these three collateral issues is that of the cost to the American Telephone & Telegraph Company of rendering the services relating to financing, development and research, technical aspects of operation and engineering, and so forth. The Court has held that a finding must be made in this case of the amount of that cost to the American Telephone & Telegraph Company for each of the years, and a finding as to the fair apportionment of that cost to the Chicago area of the Illinois Bell Telephone Company. The

evidence will cover that subject comprehensively, and put the Court in a position to make that finding, as directed by the Supreme Court.

17 The next of these special issues, if I may refer to them as such, is that of the depreciation expense, the annual charge to expenses for depreciation, whereby the Company accrues a reserve against the time when the units of the property are retired from service. The Supreme Court has held that this Court shall make its own finding as to the fair and reasonable amount of that item of expense for each of the years.

In that connection, the opinion of the Supreme Court suggested that the general experience throughout the Bell System in this respect would presumably throw much light upon that issue in so far as this Company is concerned, and, being admonished by that language of the opinion of the Supreme Court, witnesses will testify concerning the experience of the Bell System operating companies as a whole, and the experience of each of them.

There is a good deal of ground to be covered because of the many issues, for one thing, and because of the long period of time now involved, and the necessity of trying nine lawsuits in one, so to speak, since complete findings are to be made upon each of the issues for each of the years. We have prepared our exhibits, of which there will be necessarily a

18 large number, in such a way as to dispense, in so far as is practicable, with oral testimony, with a view to shortening this hearing. Most of our principal exhibits were submitted to counsel for the City, as early as the first of last August, and other exhibits prepared since that date have been placed in their hands with a view to enabling them to make their preparation, both for cross-examination and the preparation of their own defense in advance of the trial. We hope, and I am sure that counsel for the City share the hope, that the result of this preparation may be as expeditious a hearing and submission of the case as is reasonably practicable, in view of its importance and complexity.

OPENING STATEMENT ON BEHALF OF THE CITY OF CHICAGO

Mr. Haight: If your Honors please, the amount involved here in respect to the refund for past years, including simple interest, is somewhere between $20,000,000 and $21,000,000. In regard to the subject of the separation of the property, the interstate separation which counsel has mentioned, in our opinion, from the exhibits we have examined that have been furnished to us by the plaintiff, that separation is not made in accordance with the requirement of the opinion of the Supreme Court.

In respect to the Western Electric profits and prices, as far as we have been able to examine them—and our examination is still going on, though we hope to have it completed in a few days—we think that our position should be sustained, that those prices and profits are not reasonable, and indeed, that the plaintiff will be unable to show what the reasonable prices and profits are.

In respect to the 4½ per cent contract, as it has sometimes been called in the record, that is, the license contract, it is our judgment that when the evidence is in, the plaintiff will have been unable to show the cost of the contract services to the Illinois Bell Telephone Company, and we think the conclusion will be drawn that no part of the license contract service charges are properly chargeable as operating expenses in the accounting of the Illinois Bell Telephone Company.

In regard to the annual allowance for depreciation, which has been mentioned, we think that our position should be sustained, and that there will be no showing that the Commission's order entered in this case was confiscatory or arbitrary, and that the conclusion ought to be at the end of the hearing that the only depreciation for each year properly allowable is that which will be based upon the Commission's order. And in connection with the subject of depreciation, annual

allowance for depreciation, in the hearing in this Court before and in the Supreme Court, the depreciation expense set forth and urged by the plaintiff in this case was based upon book costs. On last Saturday we were presented by the Company with further exhibits on a basis of depreciation calculated upon reproduction costs, but we have received no working papers, we have had no chance to check the same or to know what underlies the figures which purport to represent depreciation expense, on the basis of reproduction costs. I take it, however, that by co-operation we can work that out
21 as we proceed through the hearing. We may have to ask for a bit of time, but I hope not.

In respect to the rate of return, we have asked for plaintiff's exhibits in respect to that, but, as I understand it, we have so far not received any. We have received some exhibits very lately showing the revenues and expenses, and property valuations for the year 1931. Those, however, came to us very recently. We have started to check those.

We still have a request made of Mr. Bracelen that I hope may be complied with shortly so that we may work with it, to furnish us data covering the license contract and the A. T. & T. corresponding data, which has already been furnished us for the years 1919 to 1930, but we have received no reply on that. I think we can work that out among ourselves, however.

There have been certain exhibits that were sent to us on the 15th and 20th of February, respectively, that may take us a little time to check over, but I think the hearing may proceed expeditiously. If we do get caught, we will represent the situation to the Court as we proceed.

It would help us very much to know if the presentation of the case as to subject matter is to be made in the same
22 order as Mr. Bracelen's opening statement. I take it first he is going on with the valuation and then the per cent condition. But if you can advise us as we go along as to your order, it will help us to keep up and prepare our case in a timely way.

WILLIAM F. SLOAN, called as a witness on behalf of the plaintiff, having been first duly sworn, testified as follows:

Direct Examination by Mr. Thompson.

My name is William F. Sloan. I reside in Chicago. I testified on the former trial of this cause, commencing in
23 April, 1928, and at that time stated my experience in the telephone and appraisal business, and qualifications as a telephone engineer.

At that time, I prepared and there was there introduced in evidence Plaintiff's Exhibit No. 1, showing among other things the cost of reproduction new of the property of the Illinois Bell Telephone Company in its Chicago area, as of June 30, 1923.

Since the former hearing of this cause, I am sorry to say that I have discovered an error in the Station Installation Account of that exhibit, amounting to $583,465. There was also included in the final summary sheet of this exhibit
24 overheads on that error amounting to $98,755. I testified that the overheads which the Company had capitalized on its books had been deducted. In this particular account the conversion factor was based on the comparison of the unit cost of putting in a telephone in each year with that cost on June 30, 1923. Up to 1920 the Company had not capitalized all of its overheads on some of the accounts, in the same amount that it capitalized them subsequent to 1920. The unit cost that we used for June 30, 1923 in this comparison had all of the overheads in it, but we unfortunately deducted only the average amount over the whole period, so that we failed to take out all of the overheads that we should have. This resulted in a cost to reproduce new the property of plaintiff in its Chicago area, as of June 30, 1923, as shown
25 in Exhibit No. 1, of $682,220 more than it should have shown. Exhibit A-1, which I have prepared, makes this correction.

Mr. Thompson: Plaintiff offers Plaintiff's Exhibit A-1 in evidence.

Mr. Haight: I would like to reserve our objections to these offers until the conclusion of the cross-examination so that there will be no waste of time.

Mr. Thompson: No objection to that at all.

26 Since I testified before, I have continued in my work as a telephone appraisal engineer, and have been engaged continuously in such work from April, 1928, to the present time. I was employed by the plaintiff to make reproduction cost estimates of its property in its Chicago area as of December 31 for each of the years 1923 to 1930, both inclusive, and commenced work on these appraisals on January 9, 1931.

27 We had six of our own men employed on the work until late in May, and five from then on until the work was completed in July. Mr. Cook (my partner) and I also were engaged on the work. Our work, including Mr. Cook's and my own, amounted to 855 man-days. We also had the services of 20 of the Illinois Bell employees, totaling 1,485 days, and 43 Western Electric employees, totaling 415 days. That is, a total of about 2,755 days were used in preparing the reports that we were engaged upon.

In securing the data underlying the various exhibits which will be presented by me showing the reproduction cost new of the property of the plaintiff in the various years, I had recourse to the books and records of the Illinois Bell Telephone Company, and we spent many days investigating the purchase records of material, the payrolls of the Company, and the various construction records during the entire period. To the extent that we made use of them in the report, we also examined the plaintiff's accounts showing the measurements of the plaintiff's plant in the Chicago area. When this

28 datum was secured, it was summarized, analyzed, and used in determining the proper conversion factors to relate the cost of construction to the year-end levels, as set out in our report.

After it had been found that the trial of this cause could

not be commenced prior to December 31, 1931, I was employed to make and did make a reproduction cost estimate of the plaintiff's property in its Chicago area as of December 31, 1931.

What I have already said about the labor involved and the records consulted, with respect to my reproduction cost estimates for 1923 to 1930, applies to my 1931 work so far as procedure is concerned, except it was shorter. The work
29 was started about December 1, and was completed and submitted on January 21.

As a result of this work I have prepared certain exhibits identified as Exhibits A-2, A-3, A-4, A-5, A-6, A-7, A-8, A-9 and A-10, respectively, which contain my estimates of the cost of reproduction new of the property of the plaintiff in its Chicago area as of December 31, 1923, and as of December 31 of each succeeding year down to and including the year 1931.

The methods which I employed in the preparation of these Exhibits A-2 to A-10, both inclusive, were substantially the same as those used by me in the preparation of Plaintiff's Exhibit No. 1, introduced on the former trial of this cause.
30 There were certain modifications in the detail, particularly in regard to the use of a varying cross-section as contrasted to a constant cross-section, for arriving at the conversion factors.

My 1923 appraisal that was introduced as Exhibit No. 1 was based upon the use of a conversion factor to convert the plant in service as of July 31, 1911 (the date of the Byllesby & Arnold appraisal), to the price level as of June 30, 1923, first as to the total plant, and then the use of conversion factors to convert the gross additions which had been put in, in each year subsequent to the Byllesby & Arnold appraisal. The factor which I used with respect to material in each case was based on a constant cross-section of the materials in the plant as of June 30, 1923.

31 In these appraisals, instead of using a constant cross-section throughout each year, I have taken as nearly as

could be determined the exact cross-section of the plant as it existed each year, and converted that to the next year-end level; and I have also taken the cross-section as nearly as it could be determined of the gross additions. This is one of the variations to which I referred a moment ago.

"The second modification of detail to which I referred had
to do with the treatment of retirements. In Exhibits A-2
32 to A-10, the present appraisals, the factors for converting the retirements are obtained by converting the appraisal at the beginning of any year to the year-end cost level of prices, and then finding the relation between that and the book cost at the beginning of the period, which converts the retirements to the exact appraisal level, and then, of course, they have been deducted on that basis. In the former case, the retirements up to 1920 had been converted to the 1923 level by the same factor as for gross additions, and subsequent to 1920, that is between 1920 and 1923, which would be a three and a half year period, the conversion was by means of the ratios of the unit costs as of the two dates. Subsequent to
1923 I have used the method just detailed.

33 The use of a varying cross-section in order to obtain conversion factors makes no substantial difference in a report prepared as the June 30, 1923 report was prepared, because that was a case where we converted thirteen separate years to a constant cost level. Now, technically and theoretically the varying cross-section is a more accurate method. Sometimes it will give a slightly higher answer than a constant cross-section, and other times it will give a lower answer; but if you take thirteen years, and use the constant cross-section method, the ultimate answer has been compensated, and it is substantially correct. However, if you are attempting to find the reproduction cost of any one year, or a series of years at different cost levels, it is more accurate to use the varying cross-section method. That is the reason that I have, in my present work, used these varying cross-sections of plant applicable both to total plant in service, and gross additions, in order to obtain my conversion factors; that is

because I have these nine different cost levels to which I must bring my reproduction cost estimates.

34 These conversion factors were prepared for each of the various plant accounts of the Company, and not for the plant as a whole. To describe the method used in arriving at my conversion factors, I will take the account for poles. From the general plant measurements of the Company, we got a typical cross-section of the entire property at any given date, and the poles representing that cross-section were priced as of the beginning and as of the end of the year; that is, they were priced as of December 31 of one year, and December 31 of the next year. Then the property was simply factored forward on that basis—that is the property as a whole. Now, the gross additions during a given year might be somewhat different in cross-section from the plant as a whole, so

35 we analyzed the gross additions of the poles for the year, and found the relation of the various sizes and kinds that existed in the actual number that were erected in that year, and instead of pricing those with the two year-end level prices, we priced them at the average cost for the year because they went in during the year, and then we priced them again at the year-end price.

The conversion factors used in each of these years in order to convert the total plant in service from one year-end level to another, and in order to convert the gross additions, are based on varying cross-sections, determined in one case by a fair cross-section of the total plant in service at the beginning of the year, and in the other case by a cross-section of the gross additions.

36 The figures shown under Account 211 for land, of $2,017,821, and under Account 212 for buildings, in the sum of $13,922,895, appearing on the summary sheet of Exhibit A-2, were furnished me by Mr. Mapes, Chief Engineer of the Company. These figures, I understand, were prepared by Mr. Renwick for the buildings, and by Mr. Ward T. Huston for the land. With respect to these figures in each of the Exhibits A-2 to A-10, I assume no responsibility. I might add that in the case of buildings there were some dollar

figures supplied to us by the Auditor of the Company which represented improvements to rented quarters, and which
37 were added to the Renwick figures to get the total shown.

In general, in the preparation of Exhibits A-2 to A-10, I used the book costs of the plaintiff in its Chicago area and applied to these costs for the various years the conversion factors. There were a number of exceptions to this where I did not use the book costs of the Company. One exception was in the case of the Main-Franklin switchboard. This entire switchboard, amounting to $858,166, was cut out of service in December, 1928. It was not retired from the books, however, until later, $737,833 being retired in January, 1929, and the balance of $120,333 being retired two months later. In my reproduction cost estimate for 1928, we considered it as a retirement in the year 1928, eliminating the entire switchboard from the appraisal for 1928.

38 Another adjustment was made in the Central Office Equipment Account in the year 1927 because of transfers from Construction Work in Progress to Fixed Capital Accounts. In that year, there went on the books as gross additions: in the Belmont office, $56,338; in the Hyde Park office, $53,433; in the Kedzie office, $51,798; in the Kildare office, $71,956; in the LaFayette office, $11,275; or a total of $244,800, which was transferred out of Construction Work in Progress to the Capital Account, shortly before the property itself was actually cut into service. This total I took out of the
39 Company's accounts for the year 1927, and put over in the year 1928. This adjustment would not affect the property accounts of the Company in any way in any year other than 1927.

I also made an adjustment in the book figures in the account of Booths and Special Fittings. Prior to the end of December, 1923, the Company's practice had been to retire booths at current cost; that is, if booths cost $100 each in a given year, retirements of booths in that year were made at $100. On January 1, 1924, it began the practice which it
40 follows in other accounts, of retiring at average unit costs, which might be described, in general, by saying

that the total book figures are divided by the total number of booths to obtain an average price for the booth, at which average unit cost it is retired. This practice was continued up to date, but in 1928 it was obvious that some error had crept into the procedure, because the retirement costs per booth were becoming too small. An inventory of the booths was made, and it was discovered that the previous inventory which had been used up to 1928 had been too great, which gave a unit retirement cost that was too small. The result was to overstate slightly the dollars appearing in the Booths and Special Fittings Account up to the end of 1928. This we corrected by going back over the years and applying the proper retirement units to the booths that had been
41 retired. In this account, by December 31, 1924 an error of $18,532 had crept into the books by reason of that procedure. By the end of 1925, it amounted to $34,893; by the end of 1926, to $57,975; by the end of 1927, to $75,312; and by the end of 1928, to $95,278. Up to this point the error had been increasing. When the error was discovered at this point, retirements began on the proper basis. By the end of 1929 the error had dropped to $81,833; by the end of 1930, to $67,332; and by the end of 1931, to $55,463. Use by the Company of the larger retirement unit costs for this account will ultimately bring the account to a place where the books will harmonize with the plant measurements. The figures I have just read disclose that in a period of four years
42 the error has been corrected to the extent of $40,000. In my appraisal, I have made these corrections without waiting for the account to adjust itself.

In making my appraisal figures used in Exhibits A-2 to A-10, inclusive, I have treated the item of $105,367.86 displaced on the books of the Company in October, 1924, on account of Central Office Equipment which had in fact been retired prior to June 30, 1923 (and concerning which there was some discussion at the former trial), as having been retired prior to June 30, 1923.

43 From my examination of the books and records of the plaintiff, made in the preparation of Exhibits A-2 to

A-10, I have no reason to believe that any corrections or adjustments of any kind or character should be made in these books, other than those to which I have testified. The corrections we made were discovered by ourselves, and, of course, we were scrutinizing the other accounts just as carefully. We fully believe that the accounts as we have adjusted them represent the correct figures of each account.

The summary sheet of Exhibit A-2 for the year ended December 31, 1923, showing a total of $149,047,858,
44 includes no amount for going concern value, nothing for cash working capital or materials and supplies, nor construction work in progress, but, aside from these items, shows all of the property of the plaintiff in its Chicago area as of December 31, 1923, at that cost level. In my opinion, the figure of $149,047,858 would be the minimum cost of reproducing the property of the plaintiff in its Chicago area, exclusive of the items I have already referred to as of Decem-
45 ber 31, 1923. The dollar figures opposite each plant account on the summary sheet of this exhibit, with the exception of Lands and Buildings, opposite Accounts 211 and 212, which I have already explained, represent my judgment and opinion as to the cost to reproduce new as of December 31, 1923, the property in each of the plant accounts of the Company in its Chicago area at the level of prices as of that date. The summary sheets shown in Plaintiff's Exhibits A-3 to A-10, both inclusive, express my opinion of the reproduction cost as of each of the dates set out in the exhibits of the property, both in its entirety and with respect to each plant account.

46 I have made no attempt to separate the reproduction cost new of this property between its interstate and intrastate use; my exhibits show the reproduction cost new of the entire property for all of its uses without separation.

I made a study as of June 30, 1923, of the amount of construction work undertaken each year of the reconstruction period, for the purpose of determining the amount of taxes and interest during construction, which was introduced in

evidence at the former trial. All the undistributed con-
47 struction costs shown on the summary sheets of Exhibits A-2 to A-10, inclusive, all like items which have been capitalized by the Company, have been excluded from the various property accounts shown on page 1. The 5 per cent for engineering and 2 per cent for administrative and legal, represent my judgment as to what the expenditures would be for doing that sort of work during a reconstruction period. They are arrived at after a careful study of the Company's own experience in regard to those expenditures, and represent my own judgment as to what would be proper and would be required to do in a reconstruction period. These are judgment and experience figures, but I actually checked the records of the plaintiff during the period of time here involved for the pur-
48 pose of ascertaining what its expenses had been. I investigated carefully the Company's own experience, and with that and my knowledge of what would be required under a reproduction theory, I arrive at the figures 5 per cent for engineering and 2 per cent for general administrative and legal.

With respect to interest during construction, taxes during construction, and insurance, I prepared, as of December 31, 1930, a study, identified as Exhibit A-11, showing the amount of construction work undertaken during each year of the reconstruction period. This also shows the cumulative cost of construction during each year, the interest charged and credited during the reconstruction period, and insurance and taxes during construction. This exhibit was prepared in substantially the same way and pursuant to the same method used in preparing my study of these same items for the plant
49 as of June 30, 1923. A refinement was introduced, however, in the calculation of interest, in that we have assumed that the money would be obtained at the beginning of each month and that the charges and credits would be compounded. The amount obtained for interest during construction is substantially the same as would have been obtained had we used the same method employed in June 30,

1923. Otherwise, the general explanation I gave with respect to this subject matter on the former trial would apply equally to Exhibit A-11.

The figures appearing on the summary sheets of Exhibits A-2 to A-10 for years other than the ones on which the studies of June 30, 1923 and December 31, 1930, were made, were
50 arrived at as follows: The 5 per cent for engineering and the 2 per cent for general were continued throughout. Interest and taxes were interpolated between the figures obtained in 1930 and the figures obtained June 30, 1923. I think this way of arriving at these items of undistributed construction costs is perfectly proper. As a matter of fact, the calculated amount of interest as of June 30, 1923, and as of December 31, 1930, was just a fraction of a per cent different. I think one was 7.98 per cent and the other was 8.01 per cent.

Plaintiff offers in evidence Plaintiff's Exhibit A-11.

51 The instrument which has been identified as Plaintiff's Exhibit A-12, showing total undistributed construction costs allocated to various plant accounts of the Company as of June 30, 1923, and as of the end of each of the years 1923 to 1931, both inclusive, was prepared under my supervision, but was not used in my work and only prepared for submission to Mr. Mapes, Chief Engineer of the Chicago area of the Illinois Bell Telephone Company, and Mr. Harris, for use in certain studies which they were making for the separation of the plaintiff's property as between intrastate and interstate during each of these years.

52 Plaintiff's Exhibit A-12 offered in evidence.

53 We made a very elaborate study to determine whether these undistributed construction costs should be allocated to plant accounts in varying amounts. We analyzed each plant account and found that the Company's own practice in allocating overhead expenses for each account varied; that each account did not get the same amount of engineering, of interest, of general expense, or what-not. The figures shown in Exhibit A-12 are based on quite an elaborate study of the proper allocation of these items to each plant account.

The reproduction unit costs for certain items of underground conduit, underground cable and load coils for each of the years 1923 to 1931, appearing in an instrument identified as Plaintiff's Exhibit A-13, were prepared under my
54 supervision substantially from the plant measurements of the Company and my appraisals, and reflect, in my judgment, the unit costs which they purport to show. This information was supplied to Mr. Mapes for his use in the separation. In my opinion, these are accurate unit costs:
55. The instrument identified as Exhibit A-14 shows omissions and contingencies allocated to plant accounts, beginning with June 30, 1923, and ending with December 31, 1931. If we had started with the books, we never would have had to consider any items of omissions and contingencies, but our starting point on this appraisal was the Byllesby & Arnold appraisal prepared in 1911. In that appraisal an allowance of 3 per cent, as I recall, was made for omissions and contingencies. As time has gone on, a large part of that plant has been retired, and this Exhibit A-14 reflects the residue remaining at the end of each year of those property accounts. In 1923 it totaled $551,264, and on page 2 of this exhibit it reduces to $295,072. In the exhibits which I have offered in this case, there is no item whatever for omissions and contingencies except this, which is carried over in varying amounts for each of the years from the Byllesby & Ar-
56 nold appraisal, and this has been reduced year by year as the property represented by the Byllesby & Arnold appraisal has been retired from the plant accounts of the plaintiff. On page 2 you will find that practically all of it is underground conduit. Some of the conduit that was in plant when the Byllesby & Arnold appraisal was made still remains.

Plaintiff's Exhibit A-14 offered in evidence.

57 I prepared an exhibit, identified as Number A-15, showing a comparison of the book costs less capitalized overheads with the appraisal totals less capitalized overheads for each of the plant accounts for each of the years referred to, that is, June 30, 1928, and December 31 of each of the years

1923 to 1931. The first column in each year was prepared from the actual books of the Company as we have adjusted them, as previously explained, and after having deducted whatever overhead charges the Company had capitalized. In the second column for each year is shown our appraisal figures for the same items. Our appraisal figures did not, of course, include going value, cash working capital, materials and supplies, or construction work in progress. The adjustments to which I have testified were made in the book accounts before I made these comparisons.

58 Plaintiff's Exhibit A-15 offered in evidence.

59 On the former hearing, I testified that the property of the plaintiff in its Chicago area had a value over and above the value of its physical property as of June 30, 1923, called going value, because it was an operating property with established routines, attached customers, trained employees, etc., and that, in my opinion, that going value was fairly represented by taking 15 per cent of the cost to reproduce new the plaintiff's property as of that time. At that time, I made quite a detailed study of many of the elements which I think should be considered in arriving at a going value figure. Since that time, I have made no detailed study to bring down to date the information that was in the record earlier in this case with respect to going value. In my opinion, the property

60 of plaintiff in its Chicago area as of December 31 in each of the years 1923 to 1931 certainly had a going value and now has a going value. This is because it is a highly organized property, well-manned, with a very capable staff of operating employees, well adapted to the needs of the community in which it is located, and through years of operation has become highly efficient and serviceable to the community.

I have an opinion, based upon my experience and knowledge as an engineer, and upon my familiarity, generally speaking, with this property, as to the amount of that going value in each of the years 1923 to 1931, inclusive, and at the present time. In my opinion, the going value of that property has been and is at least 15 per cent of its cost of reproduction for each of the years. This 15 per cent related to the repro-

duction cost new for each of the years, amounts in dollars,
61 rounded out to the nearest thousand, as follows: December 31, 1923, $22,350,000; December, 1924, $23,500,000; December, 1925, $25,900,000; 1926, $26,850,000; 1927, $28,900,000; 1928, $30,500,000; 1929, $33,000,000; 1930, $34,400,000; 1931, $34,000,000. In my opinion, the present dollar figure would be substantially the same as the year-end figure for 1931.

62 I have a list showing the gross additions to the plaintiff's property in its Chicago area as of each year from 1911 to 1923 (this sheet was identified as Plaintiff's Exhibit A-16 and offered in evidence). The figures appearing
63 on Exhibit A-16 correctly show the gross additions to plant in service made in the Chicago area as of the dates appearing there.

For the purpose of explaining what is meant by a cross-section of plant, I will take the case of the pole line plant. Suppose there are in the property a thousand 30-foot poles, fifteen hundred 35-foot poles, four hundred 40-foot poles, and seven hundred 45-foot poles. We took the actual number from the Company's plant measurement records and divided it by, as I recall, a thousand, so we reduced it down to, say, one of one kind, one and one-half of another kind, four-
64 tenths of another kind, etc. We simply reduced it down to small figures, but gave the relative proportion of each size of pole. By my cross-section I mean taking the items in the various sub-accounts of a particular plant account and getting a representative number in each of the sub-accounts, and thus a total which is representative of the account itself. This is done with respect to each plant account separately.

Cross-Examination by Mr. Haight.

65 There have been plant measurement records for, I imagine, quite a number of years back. The first one that we used was in 1923.

I have never made an inventory of this property at any

time, and I have never used, in arriving at my estimates,
66 any inventory save that one made by Byllesby & Arnold in 1911. On page 4 of Exhibit No. 1 you will find what part consisted of the result of the Byllesby & Arnold appraisal of 1911. If you will look at page 3 you will find that the Byllesby & Arnold appraisal as of August 1, 1911, was $22,113,328. In the third column you will notice that that has been con-
67 verted to a June 30, 1923 level of $41,427,357. Of course, that has been carried forward all along with the gross additions that have been made from 1911 to 1923, and from it has been subtracted all retirements, so that you get a figure in the last column of page 4 of $109,000,000 odd, which is a combination of the Byllesby & Arnold figure and the gross additions, less retirements.

I think the amount of the property represented by the Byllesby & Arnold appraisal of 1911 in existence in the Chicago plant on June 30, 1923, can be verified from these figures here. As a matter of fact, an indication of it is shown in the figure for omissions and contingencies of $551,000, which decreases each year. Now, assume that is 3 per cent, I think that is the figure, and dividing the dollars of omissions and contingencies by 3 per cent, you will get the residue of the Byllesby & Arnold appraisal every year. That is sub-
68 stantially accurate, I think. Finding out what the residue
69 was on June 30, 1923, is just a matter of mathematics.

I assume that the record is being read, and that it is correct that when I testified at the former hearing I was asked how much of the actual property represented by the Byllesby & Arnold appraisal of 1911 was in existence on the 30th of June, 1923, and that I answered in substance: "It is hard to say how much of that identical property was in existence on June 30, 1923. Of course, the retirements were made from that property as well as all other property. I could not
70 answer your question as to how much of that property was in existence on June 30, 1923, specifically. It all might be there or none of it might be there." It is true that the retirements have been made from that property as well as from the gross additions.

It has not been necessary to acquire any new information since that time as to the property represented in the Byllesby & Arnold appraisal still in existence on June 30, 1923, except to determine the residue for omissions and contingencies, which I obtained by making certain deductions for retire-
71 ments and gross additions. As a matter of fact, I think what we did was to assume that most of the retirements were made from the residue of the property in the Byllesby & Arnold appraisal before it was made from the others. That is probably not strictly correct, but it is the nearest approximation we could make for it. That could tell me approximately whether any of that property represented in the Byllesby & Arnold appraisal was or was not in existence on the 30th of June, 1923.

Let us take the case of station apparatus. You will notice on page 4 that they had in the Byllesby & Arnold appraisal $1,977,936, which was converted to the 1923 level of $3,700,141. Now, the total gross displacements in that period were $9,000,000, which was converted to $15,823,000, as of the June 30 level. Of course, you could not say that there would not be a single one of those telephones left, but when there was only $3,700,141 in existence as of a certain date, and there has been $15,000,000 retired, from a common sense standpoint you can see that all of that particular property has been retired,
72 although it is possible that one or two isolated telephones might still be there. I would say that 99.9 per cent of that particular account had been retired, that there was none of that account left on that date. This conclusion is based on the assumption that the old property would be retired first, and from my experience in the telephone business. The average life of telephone instruments in service is only about 5 years, that is, they are turned over about every four or five years. So in that particular account it is almost obvious that there would be hardly any of it left.

Now, if you take the third line, central office telephone equipment, in 1911 there was actually $3,845,969, from which there were total displacements actually of $2,877,401,

or a difference of about $968,000. There would certainly
73 be some of the old equipment left there. If you charged all of the displacements against the property in existence in 1911, there would still be some of that left. This is based on the kind of conclusion that any one could draw, looking at these figures, plus what information I have gained by coming in contact with the operation of telephone companies. It cannot be answered to the last dollar.

I know only in a general way the average life of telephone property in Chicago, speaking of it as a whole. I have
74 made no studies of any depreciation rates. In one of my previous answers, when I mentioned an average life of five years, I intended an approximate estimate of the period of time that telephone instruments remain in service and did not refer to telephone property generally. I have some opinion as to the average life of telephone property generally, but I have not made any study in this case.

75 I assume the record is being read correctly and that in the former trial I testified as follows: "The sum of the gross additions from 1909 to June 1, 1923 is practically the same as the book cost, so you can say it is about 14 years. As a matter of fact, it would be slightly longer than that, because part of those gross additions are stations which are in and out."

76 I have studies on which I could base such an answer.

Save for the principal changes mentioned on my direct examination, and some other possible minor changes, I used the same method in making the appraisals or estimates of reproduction cost new that appear in Plaintiff's Exhibits A-1 to A-9, inclusive, that I employed in connection with the old exhibit, Plaintiff's Exhibit No. 1. In doing that, I took the Bylesby & Arnold appraisal of August 1, 1911, and adjusted
77 that to the cost level of June 30, 1923, by applying to it, by accounts, certain percentage factors that measured the changes in cost level. I then adjusted the gross additions from August 1, 1911 to the end of that year, to the cost level of June 30, 1923, by applying similar factors. Then I ad-

justed the gross additions to the June 30, 1923 level for each succeeding year down to 1922, and for the first six months of
1923 in a similar manner, by applying factors which I
78 computed for each year. Then I adjusted the retirements during this same period year by year to the cost level of June 30, 1923, by applying to them factors purporting to represent the change in cost level. The Byllesby & Arnold appraisal, plus the gross additions from the date of that appraisal to June 30, 1923, minus the retirements during that period, after all of them were adjusted to the level of June 30, 1923 by these factors, equalled my appraisal as of June 30, 1923. I computed those factors by developing separately percentages of increase or decrease for material and for labor, and then combined those percentages into a composite, on the basis of the respective proportions of material and labor found in the Company's experience during each year.

79 The percentage of material in any given year represented the percentage that the material bore to the total in that year. For instance, in the pole line account, in 1913 material was 58 per cent and labor was 42 per cent.

The last line on page 114 of Plaintiff's Exhibit No. 1, per cent increase—material, means that to find what a pole
80 that was bought in 1911 would have cost on June 30, 1923, you would have had to increase it by 151.86 per cent. 151.86 per cent represents the increase in the price of a pole between those two dates. In developing my material percentage, we took a cross-section of the pole account, divided it into the various sizes of poles in accordance with the actual number of each kind that existed and priced that cross-section out each year, clear back to 1911, with the price of eastern white cedar untreated poles. I mean by cross-section that I took certain items and quantities that I considered representative. In Plaintiff's Exhibit No. 1, at page 120, exchange pole line, average material prices, we have taken five classes of poles.
81 The letter B refers to diameter at the top. The principal other classes are double-A, A, B, C and D. There are about fifteen or twenty different lengths of poles in a

plant, but I selected only Class B, and five lengths that represents about 90 per cent of all of them. When I say "cross-section" I mean that I picked out certain items and certain quantities that I considered representative and that represented about 90 per cent of all poles. The Company maintains operating plant measurement records from which I determined that they were representative.

82 I then applied to these items and quantities the prices prevailing during each year, and the prices in effect on June 30, 1923, for eastern cedar untreated poles. To get the prices in effect on June 30, 1923, in respect to poles or any other plant items, I analyzed the purchase records of the Company by years, for the period 1911 to 1923; I went over the actual vouchers and drew off the quantity purchased, and the dollars paid. Those records were bills to the Illinois Bell from the Western Electric, showing Western Electric prices.

83 I obtained from the same source the prices prevailing during the year 1922. In getting prices in effect on June 30, 1923, being Western Electric prices, not all of the bills I looked at, of course, were dated June 30, 1923. In the case of poles particularly, we had certain lists which are prepared from time to time indicating a date when a price change takes place. In our checks of the actual prices paid, we found that during a given period they check very closely with the prices shown on the list which indicated the price change level. As I recall, for getting our spot date, June 30, 1923, we used the list which contained the prices as of that da For those prices as of June 30, 1923, I used lists, and n invoices, which we checked by getting June and July pur chases also. Suppose there had been a price change that went in on July 1, but was not in effect on June 30: by

84 getting the July prices we could tell whether prices then were in accordance with the new lists, or whether the June 30 prices were in accordance with the last list. We checked the June 30 spot prices in that way. The prices for plant items during the year 1922 were obtained from the same source, from the vouchers.

To assure myself that the prices used for 1922 were prop-

erly weighted to represent average levels throughout the year, to get this cost index factor I took one type of pole, eastern cedar poles, and those prices for each year. I limited those prices to the five lengths of Class B poles that I selected as representative.

85 In each account, we took a typical representative cross-section of that account, by which I mean the kind of cross-section that I referred to in this exhibit showing exchange poles. Of course, many of the poles purchased in any year might be butt treated poles, or they might be western red cedar poles, or they might be most any type; but we have based our trend which is shown in this report on the eastern cedar poles.

To assure myself that the prices used for the year 1922 were properly weighted to represent the average levels through that year, I got the prices that the Company paid for those kinds of poles and weighted them, as shown here. There was 5.7 of one kind, 32.5 of another, and 17.3 of another. I wouldn't say that I took all purchases, all

86 quantities and all dollars for that year, but I think we got probably 95 per cent of them. There may have been a few scattering purchases we did not get. The purchases in 1922 were not all white cedar poles. We assumed that this trend factor, derived from our eastern cedar poles, was typical of what would happen to pole prices in general, both western cedars and butt treated, and what-not. I think it is very close to the actual facts. In a general way, I followed the same practice in respect to the prices for each of the years 1921, 1920 and back to the year 1911. It wasn't necessary to do any estimating for any of these years. They were the prices that were paid, and we just used them. We examined the original prices as we took them off the vouchers.

87 We took all purchases, and did not limit our analysis. The material we drew from the vouchers was all of the material purchases, including this limited amount shown in our cross-section, and all the rest of it, we got it all. To determine the level of prices prevailing from August 1, 1911 (the date of the Byllesby & Arnold appraisal), until December

31, 1911, in respect to any particular plant account was a simple process. Suppose there were 500 poles purchased during that period that cost $5,000, that would be $10 a pole. That is the way we got at it. To determine our factors, I took the prices only of the selected poles. Prices prob-
88 ably were changed during that time; certainly they were during some of the periods during the year. In some periods changes would be frequent, and in some years the changes would not be frequent. You might have 100 poles bought at $5, you might have 50 poles bought at $7.50, and you might have 200 bought at $9.

89 I did not take the particular selected items that, in my opinion, were representative of a cross-section, and all purchases for the entire period, and divide to get the price. Take one of the items that we selected, the 35-foot B pole: we may have found 10 at one price, 15 at another price, 200 at another price, and 500 at another price in that six months. We got the weighted average of those purchases for that particular size and kind of pole. That factor was then applied to all of the A poles, and the double A poles, and the
90 varying lengths, because the factor that was determined here on page 114 was then applied to the pole account. That is an illustration of what I did in respect to all plant accounts; we got the purchase price of different kinds of material each year that way.

After I priced out these items and quantities in each account in the manner described, I then applied to the result, supply expense percentages which represented the Company's experience in each year. When an item is added to one of the accounts, in general it is charged into the Capital Account at the price paid for it, except in certain cases like poles, where there are certain pole yard charges added to them, which represent shaving and painting, and things of that kind,
91 and then the supply expense, of course, is added, too.

An item which is purchased is sometimes not immediately used, and is carried in the supplies account. It might be purchased at one price and put in the supplies account, and on the smaller types of things like hardware, it might be

true that it is used a year later. On the smaller items, it might be true that the price for that item at that time might be different from the price for that same item as it existed at the time that it was purchased and first put into the supplies account; but that, in general, applies only to smaller
92 items. There might be small parts of material handled that way, currently, through supplies. But the vast bulk of material charged to work is charged at the price paid at the date of the purchase. I think that would be more applicable to hardware, and not to all of that, than to any other item. Possibly some other item. I think it is the practice of the Company to take the average price at which it entered the supplies account. Suppose they bought some bolts at 6 cents a pound, and a month later bought some at 5 cents a pound, and another month later bought some at 4 cents a pound, I think when they are charged out it is at the average price of all the bolts. That is my personal understanding of the procedure. Whether it be bolts or anything else, it is my understanding that they weight those prices as they take them out of the supplies account.

95 The man-days of which I spoke in connection with the work of preparing my estimates of reproduction cost would, I think, average about 12 hours per day and sometimes longer. The 12-hour average is purely an estimate; it was always more than 8 and probably nearer 12, I don't know exactly. The employees of the Illinois Bell
96 Telephone Company were assisting me in a variety of work. Much of it was getting out the books of record for us and helping in getting the material available for our use. In some cases, they drew off some of the material, but the computations and deductions were made by my force. I think, in general, it is true that all computations were made by my force, but there may have been some of the general compilations made by the Company's people, but it was always under our supervision. The 43 Western Electric employees assisting me principally had to do with the compiling of the data that were used in getting our index factors on the dial switchboards; that involved an analysis of practically

all the dial switchboards that had been installed in Chicago.

97 The prices used in Exhibits A-1 to A-10 were Western Electric prices as of December 31 of each year. Prices, of course, are current for more than one day. Price changes do occur in the year, and we took the prices that were prevalent as of the end of the year in each case. Take poles or cables, for example: prices may have changed, say, in October, and they may have extended through into January of the next year. We were able to get the price change dates so that we knew the price that was current as of the year-end date.

98 (Here an answer is corrected from the prior day's transcript. This correction shows in the abstract at that point.)

99 When, in answer to a former question, I stated on page 32: "In the former case, the retirements up to 1920 had been converted to the 1923 level by the same factor as for gross additions," I did not mean by "gross additions" the gross additions of the year in which the retirements took place; I meant the gross addition factor for the year 1912. The practice of the Company, up to May 31, 1920, had been to retire practically all plant at a 1912 level. I could not say what process the Company went through to get that 1912 level. As a mattter of fact that is what they used. As I recall it, I got the 1912 level from the Plant Accounting Department; either that or the Engineering Department.

100 When I said yesterday (page 33) that the use of varying cross-sections in order to obtain conversion factors makes no substantial difference in a report prepared as that of June 30, 1923 was prepared, I intended to say that in

101 the 1923 appraisal the use of a varying or a constant cross-section would give substantially the same result for both labor and material. In Plaintiff's Exhibit A-1 and in the various appraisals for the subsequent years (Exhibits A-2 to A-10, inclusive), I used a constant cross-section for labor, except in 1927 and subsequent years. I think we excluded

102 one man from certain types of construction gangs. This was a minor change described in my direct testimony.

104 (It was agreed by counsel that the witness' testimony on conversion factors on pages 34 and 35 relates to the appraisals for December 31, 1925, and subsequent years.)

105 Since yesterday, I have obtained further data on items carried in the supplies account. In 1923 and prior thereto, and as a matter of fact even up to as late as 1927, the Company maintained its own supply house or warehouse. Since, I think, 1927 or 1928, they have had a joint warehouse with the Western Electric Company. Much of the material charged to construction at that time was charged directly, or billed directly to the job; that is, if larger jobs were being
106 undertaken, the cable would be shipped directly from the Western Electric Company to the job. In other instances, the materials would have been shipped to the warehouse. I cannot tell you the proportion of each, but that was the general situation, and of that material shipped directly to the job, the Western Electric billing prices were the prices at which it was capitalized on the books. In the case of material shipped to the warehouse, it was billed in and out to the job on (using the idiom that the storekeeper uses) a first in first out basis. That is, if a reel of cable came in during one month, at a cost of 90 cents a foot, and the next month another reel came in, the price of which was 85 cents a foot, the first reel would be used up before the second reel would be used, and until that first reel was used up, the 90-cent price would be charged to the work, and then the second reel would be drawn from, and the 85-cent price would be used, and so on until the supply was used up.

In the case of smaller materials, those materials designated as minor materials, which I spoke of yesterday, such as hardware and small miscellaneous material, it is my understanding it has been charged out of the warehouse at current prices. Now, I have not any exact data as to the average length of time that materials ordinarily remain at rest in the warehouse, but the information I have indicates that the average turnover would vary from three to six weeks, that is in periods when any construction at all was being undertaken.
107 There might be a lag of two or three weeks between the date of material being charged into the warehouse and the

time it was charged out again on construction. I did not mean that the Company maintained its own warehouse only between the years 1923 and 1927. It maintained a warehouse for many years prior to 1927; I do not know how far back it went, but many years, I think.

When material was handled directly to the job and charged directly to fixed capital, it was charged with the supply expense, which was based upon the total amount of mate-
108 rial handled. The dollars for this property were charged through the supplies account in order to load them with the supply charge. I think it is correct to say that at that time all materials bought were charged into the material and supplies account and then were credited there and charged to a fixed capital account. The dollars did go through the supplies account, after which they were loaded with the average supply expense, which was the total cost of handling supplies divided by the total dollars of material handled.

109 The legend "direct supervision", appearing on pages 131 to 142 of Exhibit No. 1, means the Account 711. The percentages for local plant administration and for plant supervision and tool expense appearing on these pages, were derived from the Company's experience. This experience was derived from the Company's Plant Accounting Reports. I think it is from Reports 19 and 20. I am not sure as to the numbers, but it is a regular plant account or report. I obtained from this same source the percentage for local plant administration during the year 1922 and for the year 1912; this same account or a similar one existed in 1912. I have
110 forgotten just exactly what the accounting practice was, but it was derived from the Company's records which were either described that way or covered the same items.

I took the last payroll in each quarter for each of the years to obtain the average wage of each class of labor in my typical gang for the June 30, 1923 appraisal. (Exhibit No. 1.)
111 The payroll records for the year 1912 and prior thereto are in existence. These show the number of men employed and the average wage that was paid them. The form of the records, of course, may have changed in the different years,

but it was possible to get the wage rates and number of men employed and, as I recall, to obtain the number of men employed by classes of labor, meaning linemen, foremen, groundmen, etc., but that I would like to verify.

On page 131 of Plaintiff's Exhibit No. 1, the gang used for exchange pole lines consisted of one foreman, three linemen, one groundman and one driver, and I used this same gang
112 for the erection of aerial cables and for the stringing of aerial wires, to get the trend of labor. This is to factor forward labor; it is not necessarily the gang that was used on that particular work. As a matter of fact, I do know
113 that such a gang was used; I will put it this way: I took the number of foremen, the number of linemen and the number of groundmen in the employ of the Company for the period of 1911 to 1923, inclusive, which I had for every quarter as I just described. These were general construction men who did line work, cable work and wire work and what-not; they also did some maintenance work. I have before me the list of the number of each type of man for each year, and the average for that entire period is 1 foreman, 2.4 linemen and 2.1 groundmen, which I rounded out to 1, 3 and 2. That is the approximate average of the way work was done.

114 In 1911 the number of foremen, exclusive of cable splicing foremen, was 72; the number of linemen was 136; groundmen and drivers, 136. In 1912 there were 51 foremen, 110 linemen and 128 groundmen and drivers. In 1913 there were 67 foremen, 172 linemen and 151 groundmen. In 1914 there were 86 foremen, 164 linemen and 162 groundmen and drivers. In 1915 there were 56 foremen, 126 linemen and 123 groundmen. In 1916, 47 foremen, 114 linemen and 171 groundmen. In 1917, 51 foremen, 102 linemen and 146 groundmen. In 1918, 16 foremen, 66 linemen and 12 groundmen. In 1919, 15 foremen, 61 linemen and 10 groundmen. In 1920, 16 foremen, 51 linemen and 12 groundmen. In 1921, 14 foremen, 45 linemen and 5 groundmen. In 1922, 16 foremen, 56 linemen and 20 groundmen. In 1923, 15 foremen, 60 linemen and 28 groundmen.

The average of that entire period is very close to the cross-section used in my report. In some cases, there are more groundmen than linemen. That my typical gang has been
115 actually used in fact does not appear from this information. That is the average way the gangs were made up in the various years. The erection of aerial cable is mostly linemen's work, with some help from men on the ground. My typical gang is used purely to get a trend of labor, and I made no attempt to find out for each job the actual number of linemen, groundmen, etc., used on that job as a check for my typical gang. I assumed that my typical gang would give the proper relationship of the labor for each year as
116 compared with 1923. Nor did I attempt to find out how the average wage corresponded with the actual charges for such labor in each account. The actual labor that was in the job was carried forward by the factor that was derived by the use of this typical gang. The effect has been to carry the labor forward as it was actually expended to the new wage level, assuming that the same gang that did the work in 1914 had been converted to the same gang with the June 30, 1923, wages.

After determining the percentages of increase or decrease for material and labor separately, I combined them according to the percentages of material and labor representing the Company's experience in its construction work for that
117 year. These percentages were obtained from the records of the Plant Accounting Department—I cannot give the code number—from an analysis of specific and routine estimates. I cannot say offhand from which department I got the records, but there were records available, which I believed to be substantially accurate, and from which I took the dollars for material, for supply expense, for labor, for supervision, and for incidentals.

The items going to make up the total cost for fixed capital included material and supply expense, which we consid-
118 ered as material; the direct labor, including direct supervision, plant supervision, and tool expense, which includes the overheads capitalized by the Company; and

another item for incidentals, which is made up very largely of trucking costs and things of that sort. All of these charges, except material and supply expense, are included in the labor side in obtaining my percentages. Of course, the item for overheads was later deducted, but it is in the percentages.

In obtaining the prices current during each year and in effect on June 30, 1923, as I testified, we took outside plant account material costs very largely from vouchers. In the case of central office equipment, we took these costs from published Western Electric prices. The installation costs for
119 central office equipment in each year were taken from much the same sort of records from which we got the relation of labor and materials for the other accounts.

On page 66 is a good example of how I got the average prices during the year in the case of equipment where the prices were taken from the Western Electric price lists. There is a part of the switchboard described as subscriber line circuits; these items were priced out in each year with the
120 average price throughout a given year, which average price, if there were any price changes on an item in any given year on the price list, took into effect such change on the date it was made. I did not weight quantities purchased during the year, but if, for instance, the price for a #92 jack prevailed for eight months at one figure and four months at another, I weighted the two prices taken on the basis of eight and four.

The percentages for labor for the installation cost of central office equipment were taken from the same sort of information that the Outside Plant Account percentages of
121 labor were taken from; we went into records, I cannot tell offhand what the code number of those records is, but I could produce samples and will try to do so.

For a time it was the practice of the Western Electric Company to include installation costs with the price of the equipment sold. If you will look on page 60 of Exhibit No. 1, you will find a fairly good indication of that. In the first column, August 1 to December 31, 1911, the installation cost was only

$477 for about $11,000 worth of material. This indicates
122 that the Western Electric installation labor was included in the material. The installation cost ($477) probably covered incidental labor that the Telephone Company supplied. There are always certain odd items of labor in addition to the Western Electric labor. I do not know when this practice of including installation cost in the price of equipment changed, but as you go along later in the years you will find that the cost of labor is much higher in proportion to the cost of material because substantially it includes Western Electric installation costs plus Company costs of installation, while in the earlier years it included only Company installation costs.

123 The manufacture of the 7-A coin collector was stopped in 1915, I think. From that date on, it was carried at the last published price which, as I recall, was about $3.50 or $3.70 per coin collector. It was factored forward on the same basis as the 7-J coin collector which superseded it, and is shown immediately below it on page 103 of Plaintiff's Exhibit No. 1. The ratio between the item of $14.20, shown in the last column for June 30, 1923, for the 7-A coin collector, to the item of $6.30, shown in the next column to the left, is not the
124 same ratio that prevailed during the entire period beginning in 1911 for the 7-J collector. In 1915, the manu-
125 facture of this type of coin collector known as 7-A was stopped. The item of $6.30 shown on this page is for 1.8 such collectors which, I think, figures up to $3.50 per collector. The Company continued to use large numbers of these collectors right through to 1923, using them, however, at the last published price of $3.50. Those used they either had on hand or had turned back to what is called the Western Electric C stock, which is really a storage for the Company's own supplies, and were taken out at the same price (I believe the Western did add 20 cents to that price for a small change in insulation which they made). In arriving at our factor, we assumed that if the same type of instrument had been made subsequent to 1915, it would have increased in price in the same proportion that the 7-J did. In other words, we got

the relation between the 7-A and the 7-J at the time when they were both manufactured and arrived at the item of
$14.20 from that, that sort of calculation. We did not
126 increase the cost of this collector until June 30, 1923,
because we were trying to get the costs that actually went on the books for these coin collectors for each year, and raise that actual cost to the June 30, 1923 level, and they went on the books at $6.30. The ratio between $6.30 and
$14.20 from that, that sort of calculation. We did not
127 7-J from the date when the two were made jointly, up to
June 30, 1923. The effect of that lower price of the 7-A, when reflected in the percentages at the bottom of the page, would be that at the commencement of the year 1917, those percentages are slightly larger than they would have been had other changes been made; just how much larger it is difficult to say, but there would be some difference.

Jobs costing less than $2,500 are carried under routine
128 estimates. I do not know offhand when that limit went
into effect. There was at one time a lower limit. I think it was $1,000—it may have been $1,200, I've forgotten, but it was changed at some time during the period we have been discussing.

The unit costs on page 42 of Exhibit A-3, purporting to show the cost as of December 31, 1924, were obtained first from a study of the purchase records or vouchers for material in each of the months of the year 1924, as compared with the last published price of material for the same date.
This is the same both as to Total Plant and Gross Addi-
129 tions. The answer would be the same for either one. As
nearly as can be determined, that is an instant price for the date given, and was obtained from the Western Electric price lists compared with the last purchases in December, of the same kind of material. When I say "compared" I still
mean that I got the prices from the Western Electric
130 price lists. Prices at which the quantity shown on this
page were priced out, were obtained from the published price list of cable, if there was such a list, and if not, was taken from the December purchases. I do not remember

whether there was a price list. The average costs shown in the next to the last column under the heading Gross Additions, were obtained, as I described yesterday, from the volume of each kind of cable purchased in the year, and are the average prices for the volume purchased. The supply expense which is added to the total bare material cost, was obtained from the Company's own records. I think the account is code 19 or 20, although I do not know; at least it is one of the Plant Accounting Records.

131 The percentages of 56 per cent for material and 44 per cent for labor for the gross additions to the aerial cable account during 1924, as shown on page 41 of Exhibit A-3, were obtained from the records of the specific and routine estimates for that year. The corresponding percentages of 53 per cent for material and 47 per cent for labor applicable to total plant, shown on the same page, of necessity are calculated figures. By the addition of gross additions, there would be a tendency to change the proportions of June 30, 1923, if the gross additions themselves changed.

132 On pages 9 to 18 of Exhibit A-4, relating to central office equipment, are listed the three factors of material cost, equipment specifications and installation cost. On pages 59 and 60 of Exhibit No. 1, are listed only material and installation. I think there was a charge for equipment specifications prior to June 30, 1923, and perhaps it would have been slightly more accurate to have included whatever it was; it was not included in the original report and I doubt if it would have changed the factors very materially, if at all.

Q. On going value and expense in construction, during the construction period, I understood, in reference to your exhibit relating to that, Plaintiff's Exhibit No. 1, dated June 30, 1923, you took into consideration such matters as expense relating to preliminary negotiations, applications for charter, applications for ordinance from the City Council, applications for certificates of convenience and necessity from the Illinois Commerce Commission, and the running of advertisements, before the securing of the ordinance, with advertising costs running into a considerable sum; do you recall that?

A. I tried to consider all of the various factors that would have a bearing on the subject, yes.

133 I have made no study of this subject subsequent to 1923, but considered that all of those factors would have a bearing on each of the subsequent years. I did not particularly consider the cost of the last franchise secured by the Telephone Company from the City of Chicago; I do not know what it cost, and made no inquiry to ascertain that cost,

134 neither did I make any investigations to determine whether any advertising had been done in connection with securing the franchise; I do not consider that as a part of the going value, anyway. I knew that negotiations were being carried on for the purpose of securing a franchise, and I understand that the matter was settled, but I have not kept very close track of the affair. In a general way, I knew that it ran from 1928 to 1931, but I knew nothing specific about it because I had nothing to do with it.

135 I assumed a period of construction of ten years for the plant in 1930, whereas in Plaintiff's Exhibit No. 1 I assumed a period of nine years for construction. I cannot tell when the nine years became ten years, and made no postulation as to that. I assumed, after careful consideration, that the most economical time in which the property could be reproduced would be about ten years, and that it would begin with 1930 and continue for ten years at the constant cost level of prices of 1930. The interest during construction charge would depend upon the time of construction, and I selected a time that I thought would give the very minimum interest

136 charge. I did not make a study for each of the years intervening between 1923 and 1930, but I did make a study for 1923 and for 1930. The results of these studies were practically the same as far as percentages were concerned, and the intervening years were merely a process of interpolation. I do give a percentage figure for interest during construction in 1927, shown on page 1 of Exhibit A-6.

137 Exhibit A-1 shows interest during construction amounting to $9,604,676 (which was a calculated amount), which is about 7.8 per cent of the figure above it, which is $123,-

000,000. The figure for interest during construction on Exhibit A-9, for December 31, 1930, is $15,198,500, which
138 is also a calculated figure, the first amounting to 7.8 per cent of the physical property and the last to 7.94 per cent; that is, they are practically the same percentage. For the intervening years, in view of the fact that those percentages worked out practically identically, it is interpolated for each year. It gradually increases each year from 7.8
139 up to 7.94 for the last year. It is a gradually increasing percentage, varying from 7.8 to 7.94, determined by drawing a straight line between the two percentages and getting the intervening percentages from that line.

140 I could not reconstruct an exhibit here similar to the page headed "Amount of construction undertaken during each year of reproduction period, December 31, 1930", contained in Exhibit A-11 herein. It could be done, but for the preparation of a similar study for each of the years between 1923 and 1930 it would probably take a week. The only way to tell when the $15,000 item for right-of-way in the second year of the reconstruction period, as shown on page 146 of Exhibit No. 1, became $25,000 in the second year in Exhibit A-11, would be to make a study for each year. As to
141 these specific items, you will notice they are about seven or eight years apart. That might reflect the same man, the same amount of time, but a very great increase in salary. To ascertain this, we would have to get his wage rates and make this sort of study for each year. Our thought was, in view of the fact that the results were so close in percentage, that that work was more or less useless.

In the item of land during the second year, shown on Exhibit No. 1, $1,500,000, and on Exhibit A-11, $2,577,030, there were changes going on between these two dates. The best way to set up those changes would be to take the same appraisals of land, if they existed for both periods, and get the appraiser's figures for each period, and likewise for
142 all other items. To my mind, if the two figures at the beginning and end of the eight-year period give a percentage that is almost identical, I don't see any special rea-

son for checking for the intervening years. The figures for the beginning or the end of the period could be checked and, if found to be wrong, it could be said that all the intervening years were wrong. I don't see that you have to have each year. To determine the distribution of the various accounts for each year so that you have for each exactly the same
143 information as for 1923 and 1930, I would suggest that you either make a study for each year or interpolate, because you get practically the same answer by either method. By interpolation I mean that starting in 1923 we find 7.8 per cent for interest, and that in 1930 we find 7.94 per cent. They are almost the same percentage. If they had come out identical, both of them 7.8 per cent or 7.94 per cent, then it could be said that the exact percentage would apply to each of the intervening years. Practically, this does work, and it does not necessarily follow that there is an assumption of some factor of constant increase for each of these accounts during each of the years.

146 Exhibit No. 1 shows in detail exactly what I have done with reference to 1923, and the exhibit with reference to 1930 shows exactly what I have done for that year. The other years have not been worked out in the same way in which the tables for 1923 and 1930 were worked out, but I have assumed certain percentages between those limits,
147 because I found a certain percentage in 1923 and a certain percentage in 1930, and I assumed that the increase has been with regularity, and I estimated the intervening years accordingly. The difference between the two years
149 was 7.8 per cent and 7.94 per cent. It would be very difficult for me to tell with reference to the amount of construction undertaken each year of the reproduction period, as shown on Exhibit A-11, how to calculate the amount of right-of-way during the second year of the construction program in the 1924 appraisal. If you want that done, the best way would be for us to do it. I would have to get the relations between the wages paid the men in the two years and in 1924; the prices of materials for each of the two years; and the appraised value of the buildings for the same type of building,

as there may have been new buildings put in in one calculation and not in the other. I could not tell you how to make up each
of these accounts, and construct one of these pages for
150 the year 1924 or any other year, for any of the accounts
appearing on this sheet for any year, without making a study of it for that year. If I had involved here only an appraisal for the year 1924, and determinations had to be made for that year, it would be necessary to have given the information in detail as appearing on this sheet, in Plaintiff's
Exhibit A-11, in order to calculate interest. In the ap-
151 praisals for the years 1924 to 1929, both inclusive, the
item for engineering during construction is taken at a flat 5 per cent of the figure shown on page 1 of each report, called "Total." The item of $1,000,000 shown for engineering in the first column of sheet 1 of Exhibit A-11 does not represent 5 per cent of anything. The figure over in the right hand column of $9,576,380 is 5 per cent of the figure shown on page 1 of the exhibit for the year December 31, 1930. To distribute that amount for each of the preceding years shown in the vertical columns to the left of the column marked "Total" on sheet 1 of Exhibit A-11, I made certain studies,
and figured and calculated that before construction work
152 of this kind could be undertaken, certain amounts would
have to be expended before construction work began at all. Exhibit A-11 is my estimate of the way that the money for engineering would be expended. It totals 5 per cent of the total gross construction, but it is not necessarily expended that way.

The same situation applies to the item of 5 per cent for engineering, amounting to $6,630,623, shown on page 1 of Exhibit A-3 (the appraisal for the year 1924). As to the distribution of it during each year of the construction period, and the number of years over which it should be distributed, the question is the same as it is for right-of-way—a special study would have to be made.

To say that some time between 1923 and 1930 it would have been more economical to have used a ten-year reconstruction

period rather than a nine-year period, is one way of look-
153 ing at it. You might also say that each succeeding year might take one or two months additional, if you wanted to reduce it to that. I assumed that for the plant in 1930 ten years would be required for reproduction, and for the plant in 1923, nine years. I made no further assumptions. This assumption was only made to determine the undistributed construction charges. Frequently such a study for interest is made for one year only, and the percentage so determined is used as a reasonable amount. Here I have done it twice and got two figures that are almost identical.

On page 146 of Exhibit No. 1 is shown the purchase of $1,500,000 worth of central office equipment during the third year, and for the third year in Plaintiff's Exhibit A-11 is shown the purchase of central office equipment in the amount of $10,000,000, but the whole type of central office equip-
ment has changed. Whereas a single unit of manual switchboard might have been used in 1923, there is dial
154 equipment in the later years. The whole picture has changed. You have dial equipment in one year and manual in another. I cannot tell you how much central office equipment would be purchased in the third year in the 1927 appraisal. The determination that it would be more economical in the 1930 study to buy $10,000,000 worth of central office equipment in the third year, and more economical in 1923 to buy $1,500,000 of central office equipment was made from a study of the plant as a whole. I tried to arrive at a figure that would keep the cost of interest during construction down to a minimum. The largest figure, roundly 8 per cent, obviously indicates that I have selected almost the minimum possible way of calculating interest, as that figure, calculated on a 6 per cent per annum basis, means that if the property were to be rebuilt, it would be idle only for a
155 period of one and one-quarter years before it was put in service. I figured that money would cost 6 per cent throughout the period.

Re-direct Examination by Mr. Thompson.

I took out of the Byllesby & Arnold appraisal, which was made as of July 31, 1911, I think, before starting to convert the total plant in service as of that date to the June 30,
156 1923 level, the overheads that had been included in that appraisal. When these overheads had been taken out, that appraisal was $1,542,211 less than book cost.

I converted the gross additions that were made from year to year to the Company's property, subsequent to July 31, 1911, up to June 30, 1923, by the use of the conversion factors which I have described. I also converted the total plant in service in the Byllesby & Arnold appraisal to the June 30, 1923 level by means of the conversion factors, and then converted the displacements that had been made during that
157 same period of time to the same level. It makes no difference whatever in the dollar figures in my appraisal what portion of the property in the Byllesby & Arnold appraisal is left in service or what portion of it has been taken out, because we have simply taken that figure, plus the gross additions, and converted it to a common cost level, and then taken out all of the retirements; so the answer would be identical.

The five lengths of poles selected in my typical cross-section of plant as of June 30, 1923, namely, 30-foot, 35-foot, 40-foot, 45-foot, and so on, constitute 97 per cent of all the poles
158 in the plant as of June 30, 1923. Having selected poles of those lengths which represented 97 per cent of the total poles in the plant, I then used a certain class of those poles for the purpose of determining my conversion factor and trend of cost. For each length there were a number of top diameter designations; that is, you may have a double-A, or an A, or a B, or a C. Now, the vast majority in each given length are of the B-type, and it was the B-type in each length which we selected. I feel absolutely convinced that obtaining in that way my conversion factor to apply to the total pole line account, irrespective of the class or the size or the length of the poles, in order to convert them from the price level at one time

to that of another time, is a very accurate way to do it.

159 With respect to the other plant accounts, I followed a similar method in obtaining my conversion factors, and selected types of material which were fairly representative of the plant in service as of June 30, 1923. Take, for instance, the cable. We selected, as I recall, five sizes of aerial cable, and some fifteen or twenty sizes of underground cable. We selected the 24-gauge, the 22-gauge, and the 19-gauge types. Now, during the period under consideration, the code numbers of the cable changed somewhat, that is, the content of antimony and tin, and so forth, changed at different periods, and in view of that fact we wanted to keep that factor out of our conversion factor, and, to convert purely on a price change basis, we converted the cable to a given type, and in the 24-gauge I think it was the M-type for the large size and NM for the smaller sizes, and in the 22-gauge group we selected the code number known as the ANA. Now, in some of the previous years ANA cable was not made, but it was converted back to each of the preceding years by the factor that existed between the NA type and the ANA

160 type, so that the figures shown in our report here are for a constant size and type of cable clear through the intervening years.

I am convinced that the use of conversion factors, based upon the types of cable which I selected for the cable account, results in giving a proper conversion factor or cost trend which may be applied to all the cable in that account, for the purpose of determining the ratio between the prices as of one date and as of another. Just as in the pole account, where the lengths that we selected were upwards of 90 per cent of all the types and kinds used in the property, so here the cross-section we have taken is indicative of what the plant as a whole is.

161 The Western Electric Company always has had equipment engineering expense in connection with switchboards or other central office equipment that were to be installed, and it has always been reflected in one form or another in its prices. In more recent years, it has been

reflected under the designation of equipment engineering. In the prior years, when it was actually incurred, it was included in Western Electric billing, either in the labor, or in the cost of material. It may not always have been designated as such in prior years, and that was one reason why we left it out of our cross-section in the preceding year, and deemed it advisable to put it in in the subsequent appraisal.

With respect to the actual dollars of labor expended by the Company for gross additions in each of the years
162 included in Exhibits A-2 to A-10, both inclusive, I have converted those actual dollars expended for labor by the use of conversion factors; so that these appraisals show the exact amount of money spent by the Illinois Bell Telephone Company in its Chicago area for labor in each of those years for gross additions, converted to the level of prices as of the date of the appraisal. In making that conversion, I have used a gang that did not exactly correspond in any one year with the labor employed by the Company in that particular year. The gang fluctuated every year, as I read the figures this morning, but the gang I used is very close to the
163 average for the entire period. In order to obtain a conversion factor for labor I know of no better way than by the method that I have used.

The scheme which I have used in setting up these appraisals is to find first as of December 31 of each of these years the total cost to reproduce new, undepreciated, all the material in the Chicago area of the Company, and all the labor, to get at a figure which does not include the so-called undistributed construction costs. That figure was as of December 31, 1923, \$126,188,207. The corresponding figure for the cost to
164 reproduce the plant new as of December 31, 1931, is \$190,224,011. Now, having obtained the cost to reproduce new the physical property in the Chicago area for each of these years, there were then certain other expenses which would have been incurred by the Company in the construction of this property, commonly called undistributed construction costs, which I had to add to these appraisals by some method or other.

First, with respect to the item of engineering in each of these years, after careful study of the whole situation, I arrived at the conclusion that the engineering cost for reproducing this property would be 5 per cent. That is based on my own judgment and from a careful study of the Company's actual expenditures for engineering. That remains the same as a percentage figure related to the total cost to reproduce
165 the property new for each of the years, and is based upon my judgment as an engineer and upon the records of the Illinois Bell Telephone Company for construction work done in Chicago.

The item for administrative and legal follows the same procedure there; 2 per cent has been used throughout. In arriving at that figure of 2 per cent, I also had recourse to the Company's actual construction records to ascertain what moneys had been expended by them during this period of time for administrative and legal purposes, and considered what per cent that expenditure bore to construction work, and also what, in my opinion, was a correct allowance for the same item in a reproduction period.

168 I assumed a longer period of construction in my study as of December 31, 1930, than I did in my earlier study in 1923 because the plant was very considerably larger in the latter period, and to my mind it would probably take a somewhat longer period to reproduce the entire property under an economical building program. The plant at the date of my second study was approximately $90,000,000 larger than at the date of my first. The ten-year program for reconstructing this larger plant requires that more work be constructed in each given year of the reconstruction program than the amount of work that was required in my study made in 1923, because of the larger amount of plant to be constructed. I approached the thing somewhat after this fashion: here was a larger plant and it would probably take somewhat longer to build it, and I, of course, speeded up the construction program. The purpose of making the study was to arrive at a reasonable allowance for interest during construc-
169 tion. I made the study in 1923 on what I considered to be a reasonable building program. I also made a similar

study in 1930 on what I considered to be a reasonable building program. In the first instance, I arrived at a figure for interest of 7.81 per cent of the reproduction cost new of the physical property, and in the second instance, that figure amounted to 7.94 per cent. I considered that those were the two limits; that the amount of interest could not be less than 7.81, nor greater than 7.94 per cent. That is, there were two dif-
170 ferent plants of different magnitude, and at the end and beginning periods, I had arrived at two percentages for interest during construction, which led me to believe that the figure should not be less than one nor greater than the other, and I accordingly took for all the intervening years a figure of 7.85, which is not quite an average of the two figures; it is somewhat less than an average, and I consider it a very minimum amount for interest during construction.

The plaintiff, in the actual construction of its plant if it were undertaken, would undoubtedly incur the expenses which I have designated under the head of undistributed construction costs. It does incur similar expenses in every ordinary process of building its plant. Take the question of
171 engineering: it would be absolutely impossible and it would be very foolish to attempt to build such a property without adequate engineering preparation and design. As far as interest is concerned, it is obvious that the money will be idle for a period of time, until it can be put into service, and that money will, of course, have to be charged with interest, because the plant is constructed in advance of the time when it is possible to cut it over into service. In figuring my interest during construction, I used a 6 per cent rate of interest because, in my opinion, that is a common rate of return, and in most States it is a legal rate of return, and in my opinion is a minimum figure. I attempted to arrive at a figure that was beyond criticism, as far as its conservatism was concerned. When I say "a legal rate of return," I am referring to a legal rate of interest. It is my understanding that that is the legal rate of interest in most States.

172 From my experience and knowledge as an engineer, I think the Illinois Bell Telephone Company would neces-

sarily expend, in the reconstruction of its property, as the very minimum amounts, the several sums for engineering, legal and administrative expenses, insurance, interest and taxes during construction, as are set out on the summary sheets of my several exhibits, A-2 to A-10, both inclusive.

Exhibit A-11 does not deal with the engineering, legal
173 and administrative portion of my undistributed construction costs; that is simply a study to determine the probable amount of interest.

The following answer in my cross-examination was a misstatement:

"Answer: Well, we took all the purchases, Mr. Haight; we did not limit our analysis. The material we drew off from the vouchers was all of the material purchased, including
174 this limited amount shown in our cross-section, and all the rest of it. We got it all.".

We did not get all of the material purchases that the Company made in any year; we took all of the purchases of the types of material that we used in our cross-section. I evidently misspoke, or did not state exactly what was done, in the answer.

175 Concerning my use of plant measurements in Exhibits A-2 to A-10, inclusive, when I didn't use them for the appraisal of June 30, 1923: plant measurements were not available prior to—I think it was 1922 or 1923—in such form that they could have been used in the same way that they were used subsequent to 1923. They could have been obtained with a great amount of labor, but subsequent to 1923 they were in better shape; they were better compiled, and better tabulated, and it was much easier to use them.

176 *Re-cross Examination by Mr. Haight.*

In making the correction in my testimony when I referred to purchases, I still meant purchases made by the Illinois Bell Telephone Company from the Western Electric Company. When, during cross-examination, I said that I had made comparisons of the price lists of the Western Electric with vouchers and bills, I meant vouchers and bills for pur-

chases made by the Company from the Western Electric Company there also.

Mr. Haight: Where is that letter? If your Honor will pardon us for just about a half a minute.

By consent of counsel, the following letter written to the Illinois Bell Telephone Company by counsel for defendants, on November 13, 1931, was placed in the record:

177 "Please furnish us statements for each year, 1923 to 1929, both inclusive, corresponding to the statements shown in Exhibits 10, 11, 12, 13, 14, 15, sent to us with your letter of August 1, 1931, and dealing with Sloan's revaluation."

Mr. Haight: The exhibits referred to in the letter correspond to the present Exhibit A-11. And the reply was made by Mr. Bracelen, General Counsel for the American Telephone & Telegraph Company, under date of November 24, 1931, as follows:

"Dear Mr. Goldstein:

"We acknowledge receipt of your letter of November 13 in which you asked us to furnish statements for each of the years 1923 to 1929, inclusive, corresponding to Exhibits 10 to 15, inclusive, furnished you with our letter of August 1, 1931.

"These exhibits show the amount of construction work
178 undertaken during each year of the reconstruction period, cumulative cost of construction, interest charged and credited, taxes and insurance during construction, all as of December 31, 1930.

"Similar studies were made as of June 30, 1923, and testified to by Mr. Sloan at the former hearing.

"It is not our intention to prepare any such statements for the years 1923 to 1929, but Mr. Sloan will interpolate the results for that period.

"In Mr. Sloan's appraisals for each of the years 1923 to 1930, you will find on the summary sheet on page 1 the dollar figures showing the taxes, interest and insurance during construction.

"Yours very truly,

"C. M. Bracelen."

183 The figure $30,464,028 for central office telephone equipment, shown on page 2 of Exhibit A-4, under the heading "Cost of Reproduction, December 31, 1924, at December 31, 1925 Cost Level", was obtained from the actual costs of converting the dollar figures for central office equipment, from the year-end level at December 31, 1924, to the December 31, 1925 level. The method of doing that is shown on page 3. There the figure is shown in detail as $30,941,311 in the first column, the total for central office equipment, Account 221. In the next column are shown conversion factors to bring that from the December 31, 1924 level to the December 31, 1925 level. For instance, on the first portion of $24,565,000 it has been reduced from 100 per cent to 98.14. The manner of getting this last figure is shown on page 9. The figures shown on page 9 represent a typical cross-section of that type of switchboard. That is the varying cross-section that we have been discussing in the hear-
184 ing. It is so many sections, 1,017 sections of a board, 50,891 subscribers' cord circuits, and 360,000 answering jacks, and so forth. That is a typical cross-section of the entire property, in the figures shown on page 3. Now we have taken that quantity and priced it out on page 9 there, with the two prices, as of the two dates. The third column shows what those same items would cost December 31, 1924, and the last column shows what the same items would have cost December 31, 1923; so that going down to the totals, and dividing one by the other, you find that the price has been reduced to 98.14 per cent, and in turn everything has been carried through that way. That is the method which I followed with all of these figures. I converted not only the total plant at the end of the year by my conversion factors, but also converted the gross additions and displacements during the same period of time, so that when I take up central
185 office equipment in my 1925 appraisal, I not only have my conversion from the former year-end level of the total plant then in service, but have to consider my factor of gross additions and displacements likewise converted.

Re-direct Examination by Mr. Thompson.

It is not a part of my reconstruction theory, and I have not predicated any cost upon the entire plant remaining idle during the whole reconstruction period. On the contrary, I have tried to do just the opposite. In calculating interest during construction, I tried to cut as much plant into service, and let it carry itself, as I possibly could, and keep the interest during construction at as low a figure as possible. The net amount of my interest during construction is only upon plant which is necessarily idle until it can be cut into service. As soon as that can be done, I assume operating revenues
186 from the plant. Building would be a good example. You start your building, and you pay your contractors every month, and until you get some tenants in that building, or start using it yourself, it is producing no revenue, and accordingly you have to carry the interest charge on it.

Re-cross Examination by Mr. Haight.

Interest during construction was obtained, as I have explained previously, by arriving at the totals, which were all determined substantially as I have said, and then applying that 7.85 interest to that total. Taxes during construction were determined in much the same way. I did not con-
187 vert the 1924 interest during construction to 1925, like I did the plant items, and that is true of all the items after the total, $145,837,811, on page 1 of Exhibit A-4.
188 We excluded all the capitalized overheads of the Company in their entire construction from our book cost
189 before it was converted. I think the reports speak for themselves. We say that the book costs have had those items entirely excluded, and then the very items, interest during construction, taxes during construction, insurance during construction, general expenses charged to construction, and engineering charged to construction, at the bottom of page 1 of any one of those reports, show what has been added. We have excluded all capitalized overheads from the books, before they were converted to a different price level.

Then we have added back such allowances for those same items as would be incurred in reproducing the property.

191 I estimated the interest at a different rate of per cent than the rate the Company actually charged, because we were approaching this from a reproduction theory standpoint. In arriving at a conclusion as to what was the amount to be charged for interest during this reconstruction period, I was not guided by what the Company had in fact paid for interest.

192 The figures for gross additions, per books, shown in Exhibits A-2 to A-10, both inclusive, include all of the gross additions, against which interest, taxes, insurance, general expenses and engineering have been charged during each of the years shown; those gross additions are taken from the books of the Company. We excluded land and buildings, because we did not treat those two items. We took gross additions exclusive of those two items. As I recall, there

193 were certain interest charges that were charged against land and buildings. We considered the property exclusive of those two items, the interest charges that were charged against land and buildings shown in Exhibit A-12.

194 Land was gotten from Mr. Ward T. Huston, I believe, and buildings from Mr. Renwick; that is, we got them from Mr. Mapes, the Chief Engineer of the Company, but I understand the two gentlemen mentioned actually made the appraisals. From those two gentlemen I got just the bare value of the land and buildings, and then the interest figure was one estimated by me.

Mr. Thompson: Your Honor, the plaintiff now offers in evidence at the conclusion of Mr. Sloan's testimony, each of the exhibits, A-1 to A-16, both inclusive.

Mr. Haight: We object to all of them generally on the ground that no proper foundation has been laid or shown. In addition to that, we make the objection that the plaintiff Company's and the Bell System's course of business, as already shown by this record, precludes any rate base being fixed upon any other basis than book cost.

195 In regard to prices, at this point of the record at least the Western Electric prices have not been shown to be reasonable prices.

Also, it is apparent that the exhibits do not take into account the accumulated depreciation reserve against the property.

Also, these objections apply to the entire offer, and to each one separately, A-1 to A-16, both inclusive.

In regard to the item, total of structural value, which in Exhibit A-10 appears on page 1 in the amount of $190,224,011, and also in regard to the specific items: engineering, 5 per cent, $9,511,201; administrative and legal, 2 per cent, $3,804,481; insurance, $529,137; taxes during construction, $5,908,742; and interest during construction, $14,937,011: we object to those items appearing in the various exhibits in reference to that year, 1931, and to each of the years 1924 to 1929, both inclusive, which appear respectively in Exhibits A-3 to A-8, both inclusive, and in Exhibit A-10; and for 1930, which appear in Exhibit A-9.

We make specific objection to the total of structural value, for the reason that there is no proper foundation laid, and no facts on which to base it.

196 Also the general objection, that it is incompetent, on the present state of the record.

Judge Wilkerson: Well, now, that is a pretty long objection.

Mr. Haight: So it is.

Judge Wilkerson: There are several objections there. Read the first objection, please, Mr. Reporter.

(The first objection was read as follows:

"We object to all of them generally on the ground that no proper foundation has been laid or shown.")

Judge Wilkerson: You object to all of them on the ground that no proper foundation has been laid. What do you mean by that, that expert testimony of this kind as to reproduction, as to the cost to reproduce, is inadmissible unless there has been a complete inventory of all of the property? It is a very broad objection.

Mr. Haight: Well, as I understand it, the prices upon

which these exhibits are founded are spot prices for the end of the year, being prices from Western Electric price lists. In regard to the materials, and in regard to the labor going into the plant, of the postulates on which the testimony and the exhibits of the witness are founded, they are upon a different basis, and they are not comparable.

197 Judge Wilkerson: Well, all that, of course, would go to the weight which would be attached to the documents. But here is an expert witness who, prior to his opinion evidence as to what the cost to reproduce this property in a given year is, or at a given time, has submitted tabulations prepared by him. Now, it may be that, when analyzed, the opinion of the witness in the light of these tabulations is not persuasive. It may be that it is very persuasive. But it seems to me that the tabulations should go in, as a part of his expert testimony, and such weight should be attached to them as the Court may find they are entitled to, after considering all of these objections which have been urged against them. And in that view, the objection will be overruled; so far as that objection is concerned, it is overruled.

Now read the next one.

(The next objection was read as follows:

"In addition to that, we make the objection that the plaintiff Company's and the Bell System's course of business,

198 as already shown by this record, precludes any rate base being fixed upon any other basis than book cost.")

Mr. Haight: Of course that goes to the argument upon the merits generally.

Judge Wilkerson: Of course I suppose that a plaintiff who urges as a part of its ground for relief the contention that reproduction cost is an element to be taken into consideration, is entitled as a mere matter of evidence to submit a tabulation based upon that theory. The Court, by admitting the evidence, does not accept the theory. That, of course, is a part of the case, and that objection will bo overruled.

Read the next objection.

(The next objection was read as follows:

"In regard to prices, at this point of the record at least the

Western Electric prices have not been shown to be reasonable prices.")

199 Mr. Thompson: Your Honor, before passing the objection going to the Western Electric prices, the plaintiff desires to state for the record that, in addition to the proof already in this record on the Western Electric prices, it proposes, before the conclusion of its testimony in chief, to offer evidence that the profit made by the Western Electric Company on the business done by it with its Bell associated companies, is less than a fair manufacturing profit.

Judge Wilkerson: Well, with that understanding, the objection will be overruled at this time—I mean the objection urged as the reason why the documents should not go in.

Mr. Haight: Yes.

Judge Wilkerson: Of course, it is impossible for a party to introduce all of its evidence at one time.

Mr. Haight: I understand.

Judge Wilkerson: This is just one link in the chain, and he has offered to connect, so with that understanding I will overrule the objection.

Mr. Haight: I understand that. I just want to call attention to the fact that counsel's promise is hardly within the requirements of the Supreme Court's opinion and man-

200 date. It goes to the merits, of course. He says he proposes to show later that the prices within the Bell System are reasonable prices—of the Western Electric, that is. We have to determine here the reasonableness of the prices to this plaintiff.

But that is a point of argument.

Judge Wilkerson: That goes to the question really of what valuation is to be placed on this property in the end.

What is the next objection?

(The next objection was read as follows:

"Also, it is apparent that the exhibits do not take into account the accumulated depreciation reserve against the property.")

Judge Wilkerson: Well, that is a matter of argument on the merits. That objection will be overruled.

The next objection.

(The next objection was read as follows:

"Also, these objections apply to the entire offer, and to each one separately, A-1 to A-16, both inclusive.")

Judge Wilkerson: Let us see what that is. To which exhibit now shall we turn?

Mr. Haight: A-10.

201 Judge Wilkerson: A-10?

Mr. Haight: A-10. In making the objection I started with that one as a form, so as to apply it to all of them, and the items that I refer to, for convenience are those marked with pencil at the bottom of the page.

Mr. Thompson: And they are on the summary sheet, are they, Mr. Haight?

Mr. Haight: On the summary sheet.

Mr. Thompson: Thank you, sir.

Judge Wilkerson: That is to say, engineering?

Mr. Haight: Yes.

Judge Wilkerson: Administrative and legal?

Mr. Haight: Yes—it starts with "Total Structural Costs, $190,000,000, and then goes down to each of those items, including the engineering cost.

Judge Wilkerson: What is the objection to that, in addition to the ones you have stated already?

Mr. Haight: There is no way by which we can determine from that the alleged reproduction new estimate for each of those years, in so far as those items are concerned; and the objection is grounded upon what appeared on cross-examination yesterday, and the examination this morning.

Judge Wilkerson: That may be so, but why should not the papers go in, and then when we come to discuss the merits

202 of the case, we can hear argument as to the effect of these figures as they are here set up? The documents, with the understanding that I have indicated as to the right of counsel to be heard on the substantial questions, will be admitted in evidence.

Mr. Haight: And we may preserve an exception to each of the rulings?

Judge Wilkerson: Oh, yes.

EDWARD A. RENWICK, called as a witness on behalf of the plaintiff, having been first duly sworn, testified as follows:

Direct Examination by Mr. Thompson.

My name is Edward A. Renwick; I reside in Evanston.
203 I am the senior member of the firm of Holabird & Root, architects. The original firm was Holabird & Simons, and was founded in 1879. Then Mr. Roche came in in 1880, and the firm was known as Holabird, Simons & Roche. In 1883, Mr. Simons withdrew from the firm, and the firm name became Holabird & Roche, which continued, I believe it was until in 1929, shortly after the death of Mr. Roche, when the firm name was changed to Holabird & Root. I started in the employ of the firm in October, 1882, as a draftsman, and have been continuously connected with it until the present time,
204 having been a member of the firm since 1896. I was the business manager of the firm until 1925, and had charge of construction, after drawings and specifications were out, and the taking of bids, letting of contracts, and the carrying on of the work in construction.

In 1921, I visited and examined every building of the Illinois Bell Telephone Company then in existence in its Chicago area; those that have followed, I have been familiar with in the office. They are all work that was carried on under the firms of Holabird & Roche, or Holabird & Root. My firm has been the supervising architects for substantially all of the buildings constructed by the Illinois Bell Telephone Company in Chicago since 1921.

205 I am familiar with the size, the type of construction, the cubic content, and the general character of all of the buildings of the Illinois Bell Telephone Company in its Chicago area, included in my valuation exhibit, identified as Plaintiff's Exhibit A-17. This exhibit was prepared by me, and under my supervision and direction. It sets forth in some detail the various buildings of the Illinois Bell Telephone Company in its Chicago area, showing their cubic con-

tent, the location of the buildings, the prices at which I have appraised the buildings, both on a dollar basis and on the
206 basis of so much per cubic foot, for each of the years 1923 to 1931, inclusive. The figures appearing in this exhibit A-17 under the various listed buildings and opposite the several years therein set out, represent my opinion and judgment, based on my knowledge of those buildings and my experience as to the dollar amount of reproduction cost new of those several buildings in each of the years referred to.

Cross-Examination by Mr. Haight.

207 In Plaintiff's Exhibit A-17, the reproduction value therein given represents my opinion as to the spot value as of the date of valuation as given in each instance, and has not taken depreciation into account.

Exhibit A-17 was thereupon offered and received in evidence.

208 WARD T. HUSTON, called as a witness on behalf of the plaintiff, having been first duly sworn, was examined and testified as follows:

Direct Examination by Mr. Thompson.

My name is Ward T. Huston. I reside at 1745 Hinman Avenue, Evanston, Illinois. I am in the real estate business and have been in that business for 36 years.
209 For many years I have handled the real estate matters for the Commonwealth Edison Company, the Peoples Gas Light & Coke Company, the Public Service Company of Northern Illinois, the Chicago, North Shore & Milwaukee, and the Chicago Rapid Transit. I guess that is about all of the utilities.

Since 1908, I have been the principal appraiser for the Northern Trust Company Bank of Chicago, which is in the general banking and trust business. I have made appraisals for them of real estate held by them in trusts, or in estates, and for loans in excess of $50,000.

I have bought and sold real estate all over the City and Cook County for the Commonwealth Edison Company and
210 the other public utilities to which I have referred. I have purchased, sold, and appraised parcels of real estate generally throughout Chicago and Cook County.

In addition to the purchases and sales which I have conducted myself, and the appraisals which I have made of real estate, either for the purpose of sale or mortgage loans, I have generally, throughout the period of 1923 to 1931, inclusive, been familiar with the sales price of real estate in the City of Chicago, meaning that I have followed and am familiar with the prices at which parcels of real estate have been bought
211 and sold during that period of time in the various localities in Chicago.

I was employed by the Illinois Bell Telephone Company, the plaintiff in this case, to make an inspection and appraisal of the various items of its real estate in the City of Chicago for each of the years 1923 to 1930, and was later employed to make a like appraisal of property for the year 1931. The document identified as Plaintiff's Exhibit A-18 sets out the result of that appraisal for each of the years 1923 to 1931, both inclusive. The appraisals were made as of a spot date in each of the years, that is, I fixed the value as of December 31 as of each of the years.

Before I submitted my report to the Company for the
212 years 1923 to 1930, I personally inspected each piece of property, and have included in Exhibit A-18 a description of each piece, together with its location, its frontage, and the figure which I state is the fair market value of each of those tracts in each of the years.

The dollar figures appearing in Exhibit A-18 under each parcel of real estate and leasehold interest represents my judgment and opinion as to the fair market value of each such tract on each of the dates referred to.

The plaintiff thereupon offered document marked Plaintiff's Exhibit A-18 in evidence.

Cross-Examination by Mr. Haight.

213 The values I have given for the respective items of real property on the respective dates of the respective years were in each case spot values as of that date.

Plaintiff's Exhibit A-18 was thereupon admitted and received in evidence.

FRANK REDMUND, called as a witness herein in be-
214 half of the plaintiff, having been first duly sworn, was examined and testified as follows:

Direct Examination by Mr. Bracelen.

My name is Frank Redmund. I reside in Chicago. I am in the employ of the Illinois Bell Telephone Company and have been since 1911. Commencing with 1911, for several years I was Plant Superintendent of the Illinois Bell Telephone Company for the City of Chicago. In later years, up to 1928, I was General Plant Superintendent for the entire Company, and since 1928 I have been Assistant Vice President. By reason of my employment in the capacities stated, I was, from 1911 to 1928, very familiar with the plant and property in Chicago. From 1928 to the present time, I
215 have been familiar with it, but not in as close touch with it as I was during the previous years.

I was requested by the Company to make an inspection of the property in the City of Chicago in order to arrive at its per cent condition, and did make and cause to be made such an inspection, during January and February, 1931. I was assisted by other employees of the Company in that inspection. In connection with central office and subscribers' station equipment, Mr. A. P. Hyatt, General Plant Supervisor of the Chicago area, had direct charge of the work of inspection under my direction. Mr. M. H. Riley, Superintendent of Construction and Plant Engineering, had immediate charge of the outside plant, also under my direction, and Mr. B. T. Young,

a building engineer of the Company, of the buildings, also
216 under my direction. I chose these three men on account of their familiarity with the various parts of the work. They worked entirely under my general supervision and direction, and reported to me.

First I laid out with these three men the general plan of the inspection and the quantity of the plant which we expected to cover in various classes. I worked with them in connection with setting up the detailed plans for the inspection. In
217 the case of central offices, I made a general inspection of about one-third of the central offices with Mr. Hyatt, so that I might be directly familiar with just what he and his men were doing, and so that I also might have some first-hand information. With Mr. Young, I went over about one-third of the buildings. With Mr. Riley, I cannot state in any quantitive way what I personally did by way of inspection, but I spent quite a number of days in the field with him and his inspectors. After the reports were all in and had been summarized, I spent a very large amount of time with them in connection with arriving at conclusions as to per cent condition from the data which had been gathered.

I have prepared for use at this trial, three maps in relation to this inspection (identified as Plaintiff's Exhibit A-19,
218 Plaintiff's Exhibit A-20, and Plaintiff's Exhibit A-21). Plaintiff's Exhibit A-19 is a map of Chicago, and carries a very large number of black dots, spread pretty well all over it. Each of those black dots represents a manhole at which inspection was made of both the manhole and the cables which pass through it. The hollow rectangles which appear on various parts of the map indicate the blocks within which building cable was inspected. The boundary lines shown are the boundary lines of the City.

In the map marked Plaintiff's Exhibit A-20, the large black dots represent central offices inspected. In this case, it is 100 per cent of the central offices, all of them. The hollow squares show the blocks within which subscribers' stations and small private branch exchange switchboards were inspected. The small dots show the location of multiple private branch

exchange boards, large switchboards, which were inspected.

219 Plaintiff's Exhibit A-21 is a similar map. The hollow rectangles show the blocks within which poles were inspected. The straight lines show the locations of aerial cable inspected, and the straight lines with black dots superimposed upon them show the location of toll pole lines inspected.

The tabulation which has been marked Plaintiff's Exhibit A-22 was prepared by me to show the overall results of the inspection that I have described. The results are expressed as a per cent condition of each class of property, as shown there for each of the years 1923 to 1930. The numbers in the column at the extreme left side of the sheet are the accounting numbers, as prescribed by the official system of the Company, corresponding to the classes of plant shown. The classes of plant as listed in the next column comprise all of the property accounts of the Company, except land and right-of-way, which are omitted because they are not in the class

220 of depreciable property.

In the column subdivided into three columns for 1923, the amount shown for each of the classes of plant under the heading "Reproduction Cost" comes from the Sloan appraisal. The next column shows the per cent condition. The third column is the result of mutiplying the figures in the first column by the percentage shown in the second column, and is merely for the purpose of arriving at an overall percentage for the entire plant as shown on the last line. Each of the amounts, corresponding to each of the classes of the property, is what is frequently referred to as reproduction cost new depreciated. The last per cent condition figure on the sheet opposite the designation "total" is a composite per cent for the entire plant.

221 I took the entire responsibility for the inspection of general equipment, which covers furniture and fixtures other than the furniture and fixtures in the central offices (which are in "Other Central Office Equipment"); general store equipment (that is equipment in storerooms); general stable and garage equipment; and general tools and imple-

ments. This is the plant shown on Exhibit A-22 under account 260, designated "General Equipment:"

With regard to furniture and fixtures, I made an actual inspection of the furniture and equipment in quite a number of offices, including the larger offices of the Accounting Department. In addition to that, of course, I am in the offices all the time and am quite familiar with them. On inspec-
222 tion of that equipment, I came to the conclusion that 80 per cent would be a fair condition to apply to it, or the other way around, I found that that property was depreciated in my judgment to the extent of 20 per cent.

With regard to general store equipment, I had looked that equipment over at various times and was quite familiar with it. I made no special inspection for this particular purpose. I knew that it was in very good condition, and I assigned a condition of 90 per cent. General store equipment consists of equipment in storerooms, such as bins, shelving, trucks, and things of that kind.

General stable and garage equipment consists almost entirely of automobile equipment. In that case, it seemed to me that the best indication of the condition of that equipment would be the number of miles which it had been run, compared to an estimate of the number of miles which might be expected from the various items of motor equipment, assuming that they were run until they were no longer any good as
223 automobiles, that is to say, junk. So I made an estimate of the number of miles the various classes of equipment might be expected to run. In doing that, I discussed the matter with people who were familiar with the equipment. Then we had drawn off the actual number of miles which each item of equipment had run, and applied the percentage which one was of the other to the depreciable value of the items (that is, the cost, less what salvage we might get out of them finally), and that gave a per cent condition.

There are certain parts of automobile equipment, such as tires, which are replaced several times during the life of the equipment. An estimate was made of the proportion of the total cost of these items, and, as they are replaced more or

less frequently, it seemed that on a large fleet such as ours, the condition of that part of the equipment might be about 50 per cent. So I made a further deduction from the per cent condition previously arrived at by taking that into consideration, which brought it down a few per cent. On that basis, I arrived at a 70 per cent condition for the stable
224 and garage equipment. The parts of the automobile, other than tires, for which I made this deduction were batteries, spark plugs, bulbs, hose connections and fan belts. I think that was all. The inspection covered a total of 413 trucks or cars.

Each of the classifications shown on Exhibit A-22, for the purpose of inspection, was broken down into a large number of parts. Of course, I have not all of them in mind, but we will take buildings, for example: my recollection is that buildings were broken down into about 17 parts. It amounted all together to hundreds of parts in the entire plant.

225 The results of the inspection by the men who actually made it were made known to me first, by the detailed reports made by each man. These reports were gathered together, and summaries were prepared by Mr. Riley and Mr. Hyatt, or men in their offices. When the summaries were ready, we examined them together, and worked out the final conclusion from those summaries. In the case of poles, which were examined by district engineers familiar with the poles in their territory, the inspectors reported the per cent condition. In all other cases, the men who actually made the inspection reported in general terms the condition of each item, or in other cases they reported specific defects found. It was done differently, as deemed most suitable in different classes of plant; but they did not report percentages. Having, by means of these reports and summaries of them, arrived
226 at the per cent condition for a sub-class of plant, the proportion which each component part of any class was of the total class, was developed. In that way, a weighted percentage was arrived at for the entire class.

Various detailed methods for the selection of plant of a particular class to be inspected were followed, but I will take

poles, for example. The City was divided on maps into squares or rectangles (I don't remember exactly what the dimensions of them were), and then the block or several blocks nearest to the middle of each rectangle was taken as the point at which poles would be inspected. The idea was to secure in that way such a spread of the inspection as to get a fair view of the entire City. It was done in a similar way in regard to aerial cable. In the case of the inspection of manholes, which covered both the manhole and the cable that went through it, every tenth manhole in each run, starting from each central office, was taken. In that way, we secured approximately a 10 per cent inspection.

227 In my judgment, the method of selection employed, and the amount of plant inspected were certainly sufficient to enable me to arrive at a fair judgment as to the overall condition of the plant and as to the condition by classes of the plant. For every class of plant, we adopted some method of spreading the inspection so that it would be representative.

I have testified that all buildings and all the central offices were inspected. Those are the only instances in which the entire property was inspected.

228 In planning the work, the consideration which determined the things the field men should look for and report about specifically can best be explained by example. Take the case of underground cable: there are certain things which may exist in connection with underground cable. For instance, there may be kinks in the sheath, which mean sharp bends. It may not be properly racked. Now, we tried to think of all the things in which there could be injuries or defects, and put it up to the men to report any of those things they found. We will take the aerial cable account, take the strand and the rings on which the cable is supported. The strand may be slightly rusted, or it may be not rusted at all, or it may be badly rusted. The same thing with the rings: the rings may have slipped, allowing the cable to bow somewhat between rings. Forms were set up which provided for reports of all those things.

In the case of some other items, there were no specific things that could be reported as worn, so a report
229 was provided on which the item could be listed in one of three conditions, we will say. In the case of some items where it was possible to actually measure the wear, such as jacks and plugs, they were actually measured with gauges prepared for that purpose, and the actual degree of wear was reported.

A field inspector, with the single exception of poles, was to report the actual findings of defects, or his judgment as to which of the three conditions I have referred to the particular unit was found by him. The process by which those reports of inspection were translated into per cent condition was again different, in different cases. For instance, in the case of specific defects reported, we tried to arrive at a fair per cent which we should take off for various kinds of defects, basing that partly on the question of how much harm it might do, and partly on what it might cost to restore it to satis-
230 factory or perfect condition again. In that way, we arrived at percentages to be deducted for various defects found, and arrived at a per cent condition, taking into consideration as well, perhaps, some other things that we knew about.

In the case of items which were reported, say, good, fair, or poor, we worked out for each particular class of items a percentage to apply to each one of those three conditions, as stated by the men. That was based on the extent to which that particular item might deteriorate and still remain in plant, and what it would cost to restore it to its normal condition, and also the fact that we had been closely in touch with these men while they were making these inspections, and knew just about what they meant. From that, a per cent was arrived at to apply to each one of the three statements of conditions, and by averaging all those up, a good average condition was arrived at for that item.

While the principal factor going into the per cent condition

was the physical condition, I also had in mind through-
231 out, the matters of obsolescence and inadequacy, and I found several items which I considered obsolete at the time of the inspection. They were items the use of which had been discontinued. It was not expected to re-use them, the discontinuance having been on account of a change in practice or a change in design. Those items were considered obsolete, and given zero per cent condition. The largest of these items consisted of certain keys in the switchboard, known as call circuit keys. Owing to a change in operating practice, the use of those keys had been discontinued, and there was no particular prospect that they would ever be used again. They were not taken out of the switchboard because I don't think it would pay to take them out. I don't think enough would be realized on them to make them worth the taking out, so they remained there as part of the switchboard. Those I considered obsolete, and I assigned to them a zero per cent condition regardless of whether they were perfectly good keys as physical things or not.

232 Another item of obsolescence was certain carrier equipment and apparatus at the Morrell Park Station. We found that the use of that had been discontinued, having been superseded by a later design. The equipment had not at that time been removed, but so far as we could find, it was not likely that it would be used again; and I considered that, again, as obsolete. I gave it a zero per cent condition. Another item was a certain type of teletypewriter. They are machines similar to those which print with a telegraph instrument. Those were used on subscribers' premises, and there was one type which it had been definitely decided not to use again, and we had some of those on hand. I classed those as obsolete, giving them zero condition.

Another large item which came into that class was certain conduit. A good many years ago, what we have called paper conduit was put in in Chicago to a considerable extent, and it served a useful purpose for a long time. A considerable part of it is still in use, but about 50 per cent of it is now not

in use. That which is not in use we do not expect to
233 re-use, although we might possibly do so. It is in rather bad condition, and I gave that entire conduit a condition of 5 per cent. Now, perhaps you might say that half of it was considered obsolete because it was not in use and not expected to be re-used, and half of it perhaps you might give 10 per cent to, because, while it was still in use, it was in quite bad condition. I weighed all those factors, and said it is depreciated 95 per cent. There are close to 1,000,000 feet of that conduit in the plant.

Those are the only items of obsolete plant in the telephone plant of the Company in Chicago, in my judgment. I did not find anything which seemed to me to be inadequate. I
234 should say that the plant of the Illinois Bell Telephone Company, as a whole, is a modern Bell System plant. I think the maintenance has been very good, and it is in excellent functional condition.

Plaintiff's Exhibits A-19, A-20 and A-21, were offered in evidence.

236 As Plant Superintendent for the Chicago area for the period 1912 to 1928, inclusive, I was in direct charge of
237 the maintenance of the plant in Chicago. From 1911 to 1928, during several years, I was Plant Superintendent for Chicago, and then during later years was General Plant Superintendent for the entire Company. From 1928 to the present time, I have been Assistant Vice President and not directly in charge of the plant. In general, I know that the plant has been well maintained during the entire period involved in this case, and that about the same general standards have prevailed.

The tabular sheet, Plaintiff's Exhibit A-22, showing the final results of this inspection, extends down to 1930 and does not cover 1931. No inspection has been made since the
238 early part of 1931, which was to determine the condition as of December 31, 1930, but from my general knowledge of the conditions and the plant I feel satisfied that the condition on December 31, 1931, was substantially the same as shown for 1930. In considering the matter, I have considered

whether there have been any substantial changes that would have any bearing upon the condition, either as to changes in the standards of maintenance, actual general maintenance conditions, or changes in type of plant.

No inspections were made for the purpose of arriving at the per cent condition during the years intervening between 1923 and 1930, but during that entire time I was quite familiar with the general condition of the plant. Having made the inspection to determine the condition for December 31, 1930, I was sufficiently familiar with the plant to be able to set up a relative condition for the other years. In all but three 239 cases, my opinion was that the same condition would apply back through the years. In these three cases, I made some allowance.

The first one was central office equipment, which I showed as 93 per cent for 1929 and 1930, and 92 per cent for the years prior to that. That was on account of some quite large installations of equipment which were made, and which I believed were of sufficient importance to make a change in the overall per cent condition of the central office equipment. In the case of private branch exchanges, I showed 94 for 1930 and 88 for 1923, gradually reducing the percentage during the years. During that period, I know we made a rather unusual number of new installations of private branch exchanges, replacements to a large extent, and the consideration of that, I think, was enough to warrant reducing the per cent condition in the previous years. In the case of booths and special fittings, I show 85 per cent for 1930, which is gradually reduced to 78 per cent. That is a similar situation. During those years, we had made quite a large number of changes in booths in pay stations, more than would occur in the ordinary turn-over, and for that reason I made a 240 reduction in that account.

In the other accounts, I did not, as I have stated before, make any reduction. The overall result is that the per cent condition for the whole plant is shown as 92 in 1930, and 91 in 1923, that is, the changes in those individual accounts make but very little difference in the overall result for the entire plant.

ALBERT P. HYATT, called as a witness on behalf of the plaintiff, having been irst duly sworn, testified as follows:

Direct Examination by Mr. Bracelen.

I am the Mr. Hyatt to whom Mr. Redmund has referred in his testimony as having had charge, under his direction, of one of the three main branches of the inspection. I have had over thirty years' experience with the Illinois Bell Tele-
241 phone Company. In 1899 and 1900, I was special inspector on private branch exchange switchboard maintenance, and also involved in testing out new central offices at that time being cut over from the magneto type. The next two years, 1901 and 1902, I was wire chief at Central office in Chicago, in charge of the maintenance of the Central office plant and subscribers' stations. During the next nineteen years, 1902 to 1921, I had various titles from foreman to equipment superintendent in charge of central office and private branch exchange equipment work. In these positions, I had to do with the installation and modification of central office equipment, the testing and cutting over of all new central offices, and I also had certain equipment engineering duties. For the next two years, 1922 to 1923, I had charge of all of the maintenance of all central offices in Chicago, including the cut-over and the maintenance of the first dial office. From 1924 to date, I have had the title General Plant Supervisor, in
242 charge of the plant staff; responsible for all of the plant instructions; supervision of the practices followed in the Plant Department, including construction, installation and maintenance; the analysis and presentation of all of the operating results in the Plant Department; and the general supervision of the maintenance budget and plant operations. Practically my entire telephone career of thirty years has pertained to the general field of plant, which was covered by my part of the inspection. My experience covers the entire field covered by my inspection.

I had under me in my part of the inspection altogether between 20 and 25 men in diffeernt parts of the plant. The

inspection started in January and ran up to some time in March. After that, there was a great deal of summariza-
243 tion, checking and analyzing, that ran up to a few months ago. We had a good many different types of plant in the part for which I was responsible.

We divided central office equipment into three general classes: Manual, dial, and the equipment used for long lines purposes. Each of those classes was subdivided into what we called "component parts." Manual office, for example, we subdivided into 14 component parts so that we could break it down where we could really see it and analyze it. I picked for that particular part of the work about 10 experienced equipment men, who had served under me during my direct supervision of that work and whom I knew. I issued written instructions describing just how we wanted to inspect that particular equipment. We also had a few classes, during which we talked to these men so that we would all have a
244 uniform idea of just what we wanted to accomplish.

The necessary forms were prepared to show each of these component parts with any elements that belonged to them, and they were divided into different grades, as we called them. Some of the component parts we could grade into three parts, or sometimes four, and for convenience we called them good, fair and poor. We had a very clear understanding of what we meant by good, fair and poor. "Good" was equipment that we considered just as good as new physically. "Fair" meant there was some little thing off, some deterioration or depreciation that we considered was not in the third class and certainly was not in the first class, so we put it in the middle class. The last class we classified as poor, which is a relative term, to determine things that really had defects or something we thought should be taken care of. The inspectors filled out these forms under those particular classes, having no knowledge of the final rating, or what they would come to in percentages.

We had to decide about another class of equipment which would actually wear out, like cords, plugs and a certain
245 portion of the switchboard jacks. In those cases, we designed special tools or gauges to measure that wear.

We had in those kinds of things six classes instead of three or four; that is, the first class we coded usually "A" and that would represent the brand new article before it is worn. The last one would be zero. There was about 20 per cent difference between each one, which would give us from 100 per cent condition to zero per cent, or no wear to 100 per cent wear.

In the final ratings for these codes, "A" to "E," or good, fair and poor, Mr. Redmund and I discussed various parts of it and finally arrived at certain percentages. Of course, on the parts that wore, it was fairly accurate because of the definite relation to the wear; that is, from no wear to 100 per cent wear. For the others, we had to arrive at certain percentages, based upon 100 per cent to the point of the greatest amount of wear or depreciation. We arrived at what it aproximately would cost to replace them as good as new. In some cases, the lower base would be about 80 per cent condition; that is, the greatest amount of depreciation would be 20 per cent.

246 When most of the parts wore down to zero, that is 100 per cent wear, there was no salvage, or it was negligible, so they were given a zero rating.

The other type of inspection which involved a report by the field men of defects, rather than by grading, I have covered in a general way. The form of which I spoke which was to be filled out by the field men by code, shows the six codes. The field men would actually measure the equipment with the gauges. As to some parts of the plant within my portion of the inspection, the inspector's report was confined to the observation and recording of definite defects. In all of

247 these reports, they covered that phase of it. In no case did the field men report any percentage condition or percentage of wear; they just reported the fact as they found it, according to the form. The information on these forms was summarized in my office. The field men knew nothing about percentages and were not interested in that phase of it.

There were three sub-classes included in the general classification of central office equipment. These were manual central offices, dial central offices, and offices used for long

lines purposes. These were all included in the account
248 classification "Central Office Equipment", shown on Exhibit A-22. I arrived finally at a separate per cent condition for each of these sub-classes which was, for manual central offices, 91.41 per cent for dial central offices, 97 per cent; and for long lines central office equipment, 96.5 per cent. What is called "Other Central Office Equipment" is not a sub-class here, but is a separate account which takes care of itself. and is the next account shown on Exhibit A-22, as Account 222.

249 The records piled on the table are the original records of the inspection, those in the manila covered bindings being the ones pertaining to my part of the inspection. The ones indicated, being 31 folders, one for each office including the manual tandem board, cover the manual central office equipment. The folder indicated is a summarization of all remaining volumes, and each of the others are alike,
250 in that they contain inspectors' reports summarized afterwards; that is, each component part is tabulated.

The volume marked "Inspection of Central Office Equipment at the Austin Office" contains the original reports turned in by the men who made the inspection at that office. There are 14 component parts at the office of the manual equipment treated separately in those inspection reports.

The first of the component parts is the A and B Section Frames, which is the switchboard framework with certain equipment on it. I personally made the inspection of this particular part in every case. I covered the switchboard frames, plug rails, end sections, the back of the board, lamps and certain miscellaneous features. It did not include
251 the jacks, cords or plugs.

In order to analyze that particular component part, I broke it down into a number of sub-items, so that I could examine them and see just what condition they were in. I finally arrived at a composite condition of that, rating it, of course, just the same as all these frames (with the exceptions I have spoken about) as good, fair and poor. There are two columns for entering, for the purpose of analysis, any defects

that would not naturally come into these ratings, so I could finally arrive at the condition of that particular part of the equipment. The sub-parts into which I broke down this particular equipment were foot rails, back curtains, end sections, keyboards, retaining strips, plug rails, lamp rails, lamp caps, pile facings and jack blanks.

The Method C indicated on the first sheet of this folder shows which of the three general methods was used by me
252 in the inspection, which have been followed in this case. These methods have been previously described. Method A was the method by which we measured or gauged the wear of equipment. Method B was used where we could examine certain parts ~~very closely~~ and judge by certain calculations, not by actual measurements, but by knowledge of certain conditions; for example, the storage battery plates would come under this method. Method C was strictly an observation method. That is where I would make certain observations, that is, I would look at the equipment. Of course, Method C is very similar to Method B.

This same sheet shows the date, designates the office and its address, and the name of the inspector. It then designates "component part of central office equipment No. 1" which is one of the 14 component parts of the manual office to which I referred. No. 1 is shown on the form below as
253 consisting of A and B section frames. In each of the offices, we have a line of what we call A switchboards and B switchboards. The words on this sheet "Total A-36" indicate that there are 36 sections of A switchboard in that office which I inspected. Following that, the "Total B" with subdivisions 1, 2, 3, 4 and 5, represent the lines of B board. In most all our offices, we have more than one line of B board. Every B board represents the office prefix. In this office, we had four B units. Each B unit had a certain number of sections, just the same as the A board, and the total shows the total number of B sections for all of those four units. This sheet then shows that 36 sections of the A board and 35 sections of the B board were inspected. As I inspected
254 all central offices, this covers all the A and B boards at this office.

Next on the form are columns, in the first of which, headed "Group Designation," is set down section frames, foot rails, and so on, for the 11 sub-classes of plant that make up A and B section frames. Opposite each of these separate sub-classes in the succeeding columns are entries, as, for example, for section frames in the column "Good as New" appears the figure 56. That figure means that of the total of 71 sections in that office, 56 were placed in the grade "Good as New" by me from the summarization of the notes I had made on them. In the next column, headed "Fair Condition," the figure 15 means that 15 of the 71 sections were found to be in fair condition. The next column, headed "Poor Condition", is blank because there don't happen
255 to be any sections in that particular office in poor condition. There were some in that class in some of the offices.

Having inspected, in a manner similar to the way I have been discussing, the A and B section frames in each of the manual offices, I summarized the results from the inspection sheets for each of the component parts in the same manner I have indicated for the Austin office. I then translated these reports "Good as New," "Fair Condition" and "Poor Condition," as summarized for each office, into condition per cent.
This was done separately for the A and B section frames,
256 and I then brought the results together for each component part for all the manual offices.

The second sub-class into which manual central office equipment was broken down for the purpose of that inspection was keys. The general method of inspecting this item was to examine them for certain kinds of wear, that is, plunger and trunnion wear. The inspectors closely examined a certain percentage of the keys. This they did by operating the key to determine the amount of play. They also examined the springs and contacts. An expert maintenance man, familiar with keys, can tell fairly well just how much play is in a key. We had no way to actually measure that but depended upon our own experience to determine it. We graded the

keys in the same way, "Good as New," "Slightly Worn"
257 and "Considerably Worn." If, in testing a key, we found it had practically no play, the contact was good, the springs were good, and it was just as good as new, it would be rated in the first column of the form as good. If it was slightly worn, it would be placed in the second column, and if considerably worn, in the third column. There were two other columns for missing or broken parts, or defects, in which entries were made if any such thing were found, so that it could be put in our final calculations.

The weightings, given in my final computation to each of these columns were, for "Good as New," 93 per cent condition; for "Slightly Worn," 80 per cent condition; and for
258 "Considerably Worn," 67 per cent condition. For the fourth column, "Missing or Broken Parts," 50 per cent condition was given. These percentages were arrived at by determining that it would cost approximately 60 per cent to repair the defects listed in the column, "Missing or Broken Parts." Therefore, the range on the keys would be from 100 per cent to 40 per cent, since the depreciation could not be more than 60 per cent. We just took an average of those keys; we could not measure them accurately or precisely, but we had to get an average in each class, because some would probably have just been put in today, and maybe some would be in a condition when they would be about to enter the next class. That gave us an average on each class. The first class naturally would start with 100, so we took from 100 to 85, which gave us an average of 93 per cent for "Good as New". In the second class, the range was 85 to 75, giving an average of 80 per cent. In the third class, the range was
259 75 to 60, giving an average of 67 per cent. In the fourth class, the range was 60 to 40, giving an average of 50 per cent.

What I have just said about the weighting of these various conditions in terms of per cent, illustrates, in general, the principle followed in all similar cases, whether relating to these or some other type of plant. There may have been one or two minor exceptions, but in general this is true.

The next sub-class of central office equipment is
260 switchboard cords. This is one of the pieces of equip-
ment that lent itself to gauging or measuring, because
it wears out. We measured these cords to determine what
proportion of the cords was worn out. A brand new cord, of
course, would be 100 per cent. A cord worn out, we would
grade down to zero condition, or 100 per cent wear. It can be
determined by the length of the reinforcement of the cord
how much has been cut back. The cord is repaired so many
times before it becomes useless, and therefore, by determin-
ing how many of those repairs or cut-backs have been made,
we could determine approximately the per cent of the wear
of the cord. In the form, we put down under each code of
261 the gauge just how many cords we found under that code.
In the case of cords, there were six codes which I have
already explained in a general way.

The next sub-class is the plugs which are attached to
262 the switchboard cords. The photograph, identified as
Plaintiff's Exhibit A-23, illustrates the method of de-
termining the percentage of wear of these plugs. The in-
spector of the plugs turned in a form similar to that used
for cords with six codes on it, showing a range from good to
zero.

The next sub-class is switchboard jacks. The wear on the
jacks is confined to the sleeve portion, which we finally rated
as one-half the total jack. The method of measuring wear
on the jack is similar to the method used on the plugs,
except that on the jack the inside diameter of the sleeve
263 is measured, whereas on the plug, it was the outside di-
ameter. The photograph identified as Plaintiff's Ex-
hibit A-24 illustrates the method of measuring wear on jacks.

The next sub-class is relays. They were checked,
264 tested and inspected in the same manner that I have de-
scribed for keys. A similar form was used and they were
rated the same way, so far as the field men were concerned;
that is, good, fair and poor. There is a little change in the
form for them because we brought out a little differently
just what shape the springs were in. The relays, in general,

were inspected in the same way as keys, but there were certain things we wanted to bring out a little differently from the keys, but the same principle was carried out in filling out the form.

The next sub-class includes message registers, condensers, repeating coils and resistances. This equipment was inspected under Method C, which I have described, that is, the observation method and not the measuring method. This method was followed because on this equipment there is practically no wear. The inspection was just a matter of determining certain defects, proper markings and any missing parts. They were entered in the forms under the proper headings.

The next sub-class includes the switchboard cabling in the office, divided into position cables, multiple cables and long run cables. They also were inspected under Method C, that is, by looking for defects. We examined the condition of the forms at the end of the cable, the condition of the cable fastenings, and the general condition of the braiding. These were all braided cables and not lead cables.

The next sub-class includes distributing frames and various coil and relay racks, and the fuse boards. They also were inspected under Method C, as there is practically no wear on the equipment. There are just certain defects as to finish and missing parts which we looked for.

The next sub-class includes cross connecting jumpers on distributing frames, the terminals to which they connected, and the protectors. This came under my B Method of inspection, that is, it required very close checking of the condition of the jumpers and the terminals and the protectors to see whether there were any missing parts, and whether the jumpers were in good shape. All these defects are classified in the proper columns, and all were reported by the inspectors as far as they could find them.

Sub-class No. 11 took in the testing and repair service desks, which are certain desks in the operating rooms having some switchboard equipment in them. They were all

inspected by myself under the C-Method, and graded as I found them.

No. 12 component part was storage batteries. This came under the B-Method. In inspecting storage batteries, I was assisted by one of our expert storage battery men who is thoroughly familiar with the condition of the plates, and can tell their condition in a great measure by the color of the plates, backed, of course, by our knowledge of the methods of charging, discharging, etc. We arrived at the condition of the plates and the general condition of the battery by actually inspecting the plates, so far as we could without taking them out of the cells.

267 Next is power machines. With the exception of the commutators and brushes, there is practically no wear on these machines. The bearings have a rather long life. The big part of the machine does not wear out. These were inspected very closely to determine just how much wear on the commutators, brushes and bearings there was, and the findings were entered on the forms.

The last one took in power boards and the wiring to the power boards. That was examined as closely as we could and the condition determined. There is very little wear in that particular type of equipment.

In manual offices, the force of ten men to which I have referred was divided into crews of two each for the different types of equipment. One would make the inspection, or
268 take the measurement, or make the check, while the other was marking down in the form what was found. They would alternate because some of the tests got very tedious. All of these ten men were working in an office at one time, inspecting the different parts, and they never left the office until I arrived. I always was in the office at some time during the period in which they were inspecting, so I could make checks over the entire work that they had covered.

I did not inspect all of the units of each of these component parts, but have a summary sheet that will tell what per-

centage of the total units were inspected. The summary
269 covers the 14 component parts of all of the manual offices. It is arranged in tabular form, and shows for each of these 14 component elements of manual central office equipment, in the first column, the per cent inspected; in the second column, per cent ratio of total; in the third column, composite per cent; and in the fourth column, total units. The composite per cent in the third column was worked out to get an average per cent of the total of the central offices, which would be 43 per cent. The actual percentages are in the first column. They vary all the way from about 2 per cent to 100 per cent, and so the composite of the office would be about 43 per cent inspected. That is just a calculation. It is really 100 per cent on most of it.

270 The overall per cent condition of manual central offices was 91.41 per cent.

The next sub-class of central office equipment was dial equipment. The records of inspection made of dial equipment corresponding to those pertaining to the inspection of manual equipment which I have been explaining, are found in these seven folders (indicating). The first folder is a summary for all dial offices, and each of the remaining six folders contains the original inspection reports, turned in by the field men as the result of the inspection at the office covered by the particular folder, together with a summary for that office covering the entire inspection by component elements and as a composite.

The dial offices contain a great deal of equipment that is substantially identical with the central office equipment
271 of the manual offices. The inspection of the dial offices, in so far as the equipment there is like that of the manual offices, was done in the way that I have described with respect to the manual offices. There are certain parts of the dial offices that do not lend themselves to the same method of inspecting and gauging that was used in the case of manual offices. Certain parts of the dial equipment do wear gradually; so far as we can determine, it is a very gradual wear, and some parts, of course, have to be replaced, just like in

the manual, so we tried to determine the condition of
272 those parts as far as possible. We used a magnifying glass to look at those particular parts, and tried to arrive at an approximate percentage of the wear, or condition.

273 The three photographs identified as Plaintiff's Exhibits A-25, A-26 and A-27, show inspectors using a magnifying glass in determining the condition of moving parts of the equipment; particularly the wear upon those parts of the dial equipment lending themselves to that type of inspection.

274. I might add that the men who assisted me in this particular inspection were not the same men who were used on the central office equipment. The men who inspected the dial equipment were specialized both in the manual and dial portions of central office equipment.

The results for all dial offices are brought together in this summary folder in a manner identical with the summary sheet that I have described in connection with manual offices. This summary shows separately by component parts in three columns: first, the average per cent condition for each component part; second, the per cent ratio of the total; and,
275 third, the composite per cent. The dial equipment was found to be overall in 97 per cent condition.

The next division of my inspection which I treated separately, and for which I have a separate group of records, is the so-called long lines plant. That is the plant used for long lines and toll purposes. I divided this equipment into three parts: (1) the long lines and toll switchboards where they make the connections to toll points within the State, and with points across the country and abroad—this equipment is very similar to our manual equipment, and was inspected in the same way; (2) the equipment at Morrell Park; and (3) that in the Franklin Building.

These last two are repeater stations in connection with the long lines and toll lines. The Franklin Building is principally telephone repeater, some carrier current and some
276 broadcasting apparatus. Morrell Park is principally a telegraph repeator station, has telegraph apparatus,

although there is some telephone and some carrier apparatus there.

The four folders indicated cover this property. The summarization is in one folder, and the original inspection reports are in the other three. All of this equipment is located in the three offices I have referred to. This long lines equipment was found to be in an overall condition of 96.45 per cent.

277 The remaining sub-class of plant included within the general classification of central office equipment is designated in the accounting system as "Other Central Office Equipment." That was covered by my personal inspection in every office. I inspected 100 per cent of this equipment. I finally found, after consultation with Mr. Redmund, of course, 94 per cent condition for this property.

I have now covered the four main sub-classifications, which comprise the total of central office telephone equipment, Account 221, shown in Exhibit A-22, and have given for each of these four sub-classes the separate per cent condition which finally, weighted, resulted in the figure of 93 per cent, shown in Exhibit A-22 for all central office telephone equipment in 1930.

The next general section of my inspection covered station apparatus, inside wire, drop wire, interior block wire, etc.

278 Subscriber station apparatus includes the telephone equipment at the subscriber station and is a separate account. The inside wire or station installation, is the wiring that connects to these stations. It also is a separate account, and is treated separately in our inspection.

This stack of folders contains the original inspection reports and summary sheets covering this part of the inspection. Aside from the one folder of summaries, each of the other folders covers an inspection area which was a central office area.

Station apparatus was broken down into about 10 component parts in a way generally similar to what was done in the part of the inspection my testimony has already covered. The wiring, of course, was not so broken down; that is just one component part, or class.

In connection with station apparatus, the first thing
279 was to select a representative number of stations to inspect. I think that a map has already been presented illustrating this. We arbitrarily divided each office area into ten sections on the map, and then spotted about the center of each of those sections. We then picked from our records a certain number of stations to inspect, those chosen having such a relation to the total in that division, and to the classes of service, that we would get a repesentative picture of the classes of equipment. They were also of such a number in each district as to bear a proper relation to the total for the City. Then we went out and inspected these instruments, using men who were thoroughly familiar with the station maintenance. They filled out suitable forms which we had made up and discussed with them so they would know just what to look for. These forms were filled out in a very similar way to these other forms; they recorded the condition they found as to the station equipment, that is, good, fair and poor.

These same men at the same time inspected the inside wiring, which is another account, and arrived at the condition
of it. Then they placed that on the same form which we
280 used for the station apparatus. They also inspected the exchange aerial wire, or drop wire that connects from the outside terminal to the station.

The condition of all of that particular equipment was determined and entered on the forms, and then we rated it later in a manner similar to what I have described before.

We inspected a certain number of stations, picked by the method I have described, on the subscribers' premises. In order to check that, we inspected about three days' receipts of equipment returned to the Western Electric. This is equipment that was being taken out of the subscribers' premises; it is what we call our turn-over, or station movement. There are a large number of people moving all the time, going in and out of premises, so the telephone is coming in and out; or the classes of service are being changed, so that there is a constant movement in these station telephone equipments

going back to the Western, where they are rehabilitated, and go back again into service. By checking three days' re-
281 ceipts from that movement at the Western Electric, for the same type of equipment and in the same manner, we arrive at about the same per cent condition. Therefore, we were satisfied that we had a representative number of stations, although it is not very large in number.

For station apparatus, we found a final per cent condition of 91 per cent. That is a main account and appears on Exhibit A-22 as Account 231.

In that same account (231) is included our telephone typewriters, and as we also arrived at a per cent condition for those, the 91 per cent is a composite of not only this station apparatus which I have described, but also telephone typewriters.

282 These records that are here have been available since last August for examination by the representatives of the City, and to my knowledge they have made considerable examination of them.

283 The next general section of my inspection was of private branch exchange switchboard equipment, which is covered by the records contained in those six folders (indicating). These records do not all relate to the manual multiple type, but cover different types. There is one folder,
284 the first, relating to manual multiple type private branch exchange switchboards. The next folder has the inspection reports on the dial P. B. X. boards. The next one covers non-multiple cord P. B. X. boards. The next covers cordless type P. B. X. switchboards. Another one shows the results of the inspection of cordless P. B. X. boards at the Western Electric, and the last one shows the non-multiple type inspection at the Western Electric.

The first of these, that is, the manual multiple type, is very similar to the manual central offices that I have described, and for it we used similar forms, with not quite as many component parts or breakdowns. The inspection was made in about the same manner as described for manual central offices. We used gauges to measure parts that would wear,

and also the other two methods as I have described them,
285 B and C, for inspecting the other equipment. The dial P. B. X. is similar to the central office, in so far as the method of inspection is concerned. We inspected the manual portion of the dial board in the same manner as the manual central offices. We inspected the moving parts of the dial equipment with magnifying glasses, and used about the same forms that we used in the central offices, and the proper number of component parts.

The non multiple cord type P. B. X. board is simpler than the multiple type described. It has practically all the same elements in it, only in a more concise form or shape, so that the inspection was simpler, but the same general method was followed. The cordless type has no cords or plugs, therefore we do not have those wearing parts to gauge or measure. The keys and wiring are the principal parts of cordless boards, so that was comparatively simple equipment to inspect, compared with the other. However, it was inspected in about the same way, by testing the keys and looking at the wiring, and putting down any defects in the general conditions under good, fair and poor.

I might add that a couple of those folders showed
286 forms used at the Western Electric. We checked a certain number of boards that came back in the station movement, as I described for station apparatus, in order to see whether we were really getting a right check on this equipment at the subscribers' premises. This gave us a fairly good check in the same way that I described for the station apparatus. The station apparatus and the P. B. X. apparatus that was checked in the Western Electric shop was all apparatus moving out of the Illinois Bell Company's plant here in Chicago. It was principally the cordless type, a little cabinet, that comes in, so it is easily inspected and checked. It does not change its condition from the time it leaves the subscriber to the time it arrives at the Western Electric. We did not check any multiple P. B. X.'s at the Western, because they are all knocked down when returned. We could only inspect them on the subscribers' premises.

I determined a per cent condition for each of the classes of plant I have last been describing separately. This per
287 cent condition was: for the cordless type, 94.87 per cent; for the non multiple cord type, 94.12 per cent; for the multiple manual, 93.18; for dial, 97.81. The composite was 94.

Then my inspection covered public pay station booth equipment. This large volume (indicating) contains the original inspectors' reports, and summary records of that inspection. The type of report turned in by the inspector in this case was similar to the report we used for station apparatus, which showed good, fair, poor. In this case the report showed good condition, slightly worn, considerably worn. These conditions were arrived at in the same manner as station apparatus. We picked out what we thought was a representative number of booths scattered all over the City. Of course, a great portion of them were in the loop, because that is where
288 the largest number are. We inspected the condition of those; breaking them down into a number of sub parts so we could analyze them, like the frames, the exterior and the interior of the booth, the glass, the doors, locks, shelves, switches and directory hangings, all part of the booth account; 85 per cent condition was found for that class of property.

This last folder (indicating) covers picture transmission in the Telephone Square Building and wire telephony, broadcasting equipment for subscribers' pickup. The picture transmission portion of that account is much the largest part of it, in fact, it constitutes most of it. For that we used forms in the same manner as with the other equipment. I selected a man who is thoroughly familiar with this equipment to assist me in checking it. We broke it down into a number of component parts, in the same manner as the other equipment, and arrived at the percentage condition by deduct-
289 ing for the various things that we thought were worn or depreciated. I arrived at a percentage condition by sub-classes within this general class. These findings for the sub-classes are: for the picture transmission, 85.15 per cent condition; for the wire telephony, broadcasting, 87 per cent.

The right to use a certain portion of the conduit at the

Union Depot was purchased. We assigned a percentage to that conduit to correspond with the per cent condition assigned by Mr. Riley for his conduit for the City; that was 91 per cent.

The composite for the entire miscellaneous account is 85 per cent.

290 The photograph identified as Plaintiff's Exhibit A 28, is entitled "Method of selecting answering jacks and out trunk multiple jacks"; these are on the A boards. We have three classes of jacks in the manual switchboard: answering jacks, which have the most wear, because they are used more; the out going trunk multiple jacks on the A board; and, as shown on the other photograph identified as Plaintiff's Exhibit A 29, the subscribers' multiple jacks on the B board. In these photographs, there are certain groups outlined in red, showing our method of selecting the items to be inspected.

The answering jacks are the group on the lower part of the A board. The photograph shows one section of the A board. We picked one panel in each section; that is, every tenth panel of the A board, and tested all of those jacks, which gave us about 10 per cent of the answering jacks on the A board. We selected the outgoing trunk multiple jacks on the A board and the subscribers' multiple jacks on the B board in a little different manner. We stag-
291 gered them, spotting them on different parts of the board in order to get a representative picture, not only of the wear, because we thought that gave us a good picture of it, but also a good relation between the newer parts of the board, because additions to the multiples are made on the top, and extensions are made at the end. We therefore scattered this in such a way that we would get a good representation of new and old; that is, the old relatively speaking, the newer part and the older part. It also gave us a pretty good representation of the traffic conditions on those jacks.

294 The photograph marked for identification Plaintiff's Exhibit A-30 illustrates the method of inspecting cords

by exact measurements so they are divided into condi-
295 tions, A, B, C, D, E, and F, as I have described before. This shows correctly the method of gauging.

The folder marked for identification as Plaintiff's Ex-
296 hibit A 31 is practically a complete set of the forms which were placed in the hands of the inspectors and filled out by them at the time and place of the inspection. In some cases, where the equipment was the same, we made a slight change in one of the forms and used it for this other equipment, but in most every case that folder is complete. I have described generally the methods of inspection, and with some particularity the method in a particular case. These forms, together with my testimony, will show the things the inspector was to report, where there were specific things. It will also indicate the method of inspection; that is, whether it was by the use of gauge codes, as in the case of cords and plugs, for example; or whether it was by the judgment of the man himself, that being the only applicable gauge; or whether specific defects were to be reported.

297 The folder identified as Plaintiff's Exhibit A 32 contains 18 pages of tabulations. This was prepared by me from the records that are here in Court, and about which I have already testified generally.

298 The first sheet, headed "Per Cent Condition of Central Office Telephone Equipment, Account 221", and the next succeeding four sheets, that is, pages 1 to 5 of Exhibit A-32, relate to the entire class of plant shown on Exhibit A 22, as Account 221.

The first sheet of Exhibit A 32 deals with the first sub-class of that property, namely, all manual central office equipment. I have already said that this equipment was broken down into 14 component elements for the purpose of inspection. Those component elements are shown in the first column of this page.

Taking the first component element, that is, the A and B section frames, the second column shows the number of units

of this component element inspected. This is a sum-
299 marization, and the figure 1828 in this second column
means that that number of A and B section frames of manual offices were inspected throughout the City. The next three columns show that the inspectors reported the items inspected as being in good condition, fair condition, or poor condition, in the numbers indicated. Of the 1,828 A and B section frames inspected, 1,187 of them (the number shown in the third column) were reported by the inspectors as being in good condition.

The report form used by the inspectors for this equipment, which is the first sheet in Exhibit A-31, is headed, in the first
column, "Good as New", in the second column, "Fair
300 Condition"; and in the third column, "Poor Condition".
Therefore, what is designated on this summary sheet in the column marked "Good Condition" are those units reported by the inspectors in the first column of the form as "Good as New".

Of the 1,828 frames inspected, 547 were reported in fair condition and 94 of them were reported in poor condition.

The figure 94.18, which is the next entry for the A and B section frames in the column headed "Average Per Cent", signifies the average per cent condition of that component part for the City. It is the result of the sum of the products of each of those grades, divided by the total number inspected. In other words, it is the number found in the third column,
under the heading "Good Condition", multiplied by the
301 percentage assigned to that particular grade. Likewise,
the number shown under the next column, that is, "Fair Condition", was multiplied by 90, the percentage assigned to that grade, and the 94 items in the next column, headed "Poor", were multiplied by 83. The sum of all of these multiplications, divided by 1,828, the number of units inspected, gives the average percentage, or 94.18. This is a straight arithmetical computation.

The 16 per cent in the next column, headed "Ratio of Total", represents the percentage of that component part

to the total central office, based upon a study of a typical office, to get the relative value of each of these 14 component parts. This shows that the A and B section frames of a manual office comprise 16 per cent of the value of the entire central office.

In the last column, headed "Composite", the entry of 15.07 is the multiplication of the average per cent of that component part; that is, the ratio 94.18 per cent is multiplied by 302 16, the ratio of total giving a composite of 15.07. That is done to get the final composite per cent for all component parts, and gives the weighting for that particular part. When that same process is carried out for all the 14 component parts, as the exhibit shows has been done, the overall per cent condition of the manual central offices will be shown as an addition of the figures of that last column.

On the form of inspector's report for the A and B section frames, there are columns headed "Dented or Chipped" and "Missing or Broken Parts". In addition to classifying the part inspected as being "Good as New", or in "Fair Condition", or in "Poor Condition", the inspectors also re-
303 ported specifically in these two columns. I personally inspected this particular component part, and made notes on the lines provided for such remarks. I not only filled out the two columns just described, but also checked all of the elements that went into the frames, so that I could arrive finally at the number of sections that ought to be classified as "Good as New", "Poor", and "Fair". This having been done by myself, does not come out in the summary as extra items. If the men themselves had done that, it would have been carried out as extra items. I assigned a percentage condition for that after arriving at the depreciation value.

As I said before, the inspector's form for this particular sub-class, which is shown as of the first sheet of A-31, was used by me personally. Wherever the field men made remarks, they made notes of them on the back of the forms they filled out. The remarks would be to the effect that certain things ought to be considered which we had not discussed

individually in these various grades. I would then dis-
304 cuss that with them. As I have already mentioned, I interviewed the men before they left the central office and we discussed these particular items, so that I had a clear understanding of what all of those things were before I finally gave them rating values. The men did not apply any percentages. They just described the things.

To determine the percentages I have applied for the A and B section frames on the first or summary sheet of Exhibit A-32; that is, 97 per cent for those frames reported in good condition; 90 per cent for those reported in fair condition; and 83 per cent for those reported in poor condition; I first determined upon my base. I considered that the worst condition I found would not cost more than 20 per cent of the value to be put in as good as new condition. That
305 gave me a base of 80. I know from my own experience and from what I saw in this inspection that there is a great deal of this particular component part that is just as good as new, and a great deal of it that was recently installed, so the top would be 100 per cent. This kind of inspection, it seemed to me, would give a little better result if we got the average, because, of course, there was a variation. I therefore broke this item down into three grades between the 100 per cent and the base, which I divided, not necessarily equally, but according to my judgment, with the variation in the wear. In this particular equipment, there is a small percentage that wears, so that took me down to 80. That would give the first grade 100 to 94, with an average of 97; the next grade would go from 94 to 86, with an average of 90; and the third grade from 86 to 80, with an average of 83 per cent.

306 A very large percentage of these switchboard frames are of iron, and as they are protected from the elements inside of the office, cannot rust. We could not see that there would be any normal depreciation in them at all, so that the range from 80 per cent to 100 per cent would represent a rather large percentage of the total. The next part would be the woodwork on the front, back and top of the boards and

on the key and plug shelves. On the woodwork on the front, the top, the back and the cornices, there is practically
307 no depreciation. I took into consideration that the finish might not be quite as good as new after a period of time. But the iron and wood is a very, very small part of the depreciation. Then there are the foot rails that the operators' feet rest on. They are metal and they do not wear out. They represent a certain percentage of the total component part. This base of 80 per cent represents in my judgment the per cent of the equipment that does not wear out.

The section frames are very rugged. They all have cross braces, and I would consider them extremely rugged, especially when you consider that we can re-use them over and over, and take them out and re-use them at other places, and they do not fall to pieces. There is never any occasion to take them out because of their wearing out. They would
308 only be removed because of a change in the office, or for additions, or shifting a board from one floor to another, which has been done.

My explanation of the meaning of the entries in each of the columns in the case of A and B section frames also covers the next item, keys. The inspector reported keys as in good condition, or slightly worn, or considerably worn; and also inspected, as the next column shows, for "Missing or Broken". This means a missing part of the key, which may be just the identification of the key, and is a small item. Of the 43,000 odd keys that were inspected, the inspectors reported 36,000 on the form, which again gives the first or highest condition, as "Good as New"; reported 4,300 odd keys slightly worn, and 2,300 keys considerably worn, with 403 out of 43,000
309 having some missing or broken parts.

In determining my ratings of 93 per cent for those keys in good condition, 80 per cent for those slightly worn, 67 per cent for those considerably worn, and 50 per cent for those having missing or broken parts, I found the base to be about 40 per cent. That is, it cost about 60 per cent of the value of the key to make it as good as new. Forty per cent is the per cent condition of the lower part of the lower grade.

Now, going to the top again, 100 per cent, the range would be from 100 to 40. There happen to be four grades here, so the range of each grade worked out according to the following: 100 to 85 gave 93 per cent for the "Good as New" condition; 85 to 75 gave an average of 80 per cent for the "Fair or Slightly Worn" condition; 75 to 60 gave an average of 67 per cent for the "Considerably Worn"; and 60 to 40 gave
310 an average of 50 per cent for the fourth grade, which not only included "Missing and Broken Parts", but also "Contacts Badly Pitted", as shown by the form. We just bunched these items, and did not put down on the summary all of the wording. But it takes in everything that would come in that class, which we considered as the worst condition of the grade, and would be 40 per cent condition or 60 per cent depreciated.

We rarely change any key because it is worn out. There are parts that wear; just like other parts of our equipment, but our maintenance standard is such that we are continually checking and watching to replace those parts when they wear to such a point that they would affect service. That is a continuous maintenance process, and when they become necessary, the replacement parts are new parts. When there is occasion to replace parts of these keys, they are replaced with
311 new parts, and to that extent the part is being restored to new condition. The cost of replacing parts in such case is a maintenance charge, and is a current charge to expense. The keys, as shown in the next entry, were found over all to be in 89.91 per cent condition. They comprise 1.3 per cent of the total value of the equipment, and constitute a composite of 1.17 per cent.

The next component part, cords, of which 19,000 were inspected, are classified here under code designations A, B, C, D, E and F. That is one of the cases where precise measurements could be and were made and reported by the inspectors. In this instance, Column F, the lowest grade of cords, indicates that those found in that column are
312 given zero condition; that is to say, of the 19,000 cords inspected, 766 cords were found totally depreciated. They

were ready to be removed and replaced by new ones on the regular maintenance basis. The process by which I evaluated the number reported under each code designation by assigning these various per cents to each class, as shown on the exhibit, was practically the same process that I have described for the keys and the frames.

The next class, plugs, is similar. There I had the measurements which the inspector made and reported, and the six code designations, with a final zero per cent as to that class.

The same thing is true of jacks, with the exception
313 of the base. It did not go to zero because here the range is not all of the ~~way from~~ zero to 100, but is from 50
314 to 100. The part of the jack that we gauged or measured for wear represents a little less than one-half of the value of the jack. We assumed that the part that wears out is only 50 per cent, and that 50 per cent does not wear out and was just as good as new. Therefore, the base could not be lower than 50 per cent, although the wearing portion we measured did go to zero. This wearing portion represents less than one-half, but we finally computed it at one-half, giving it a base of 50 per cent. I used the 50 per cent in calculating it because that was correct, or approximately so. Actually, the value was a little less than one-half.

315 For relays, this summary sheet shows that more than 205,000 relays were inspected, of which more than 200,000 were reported by the inspectors "Good as New", and given 98 per cent condition. In the final column, nearly 1,700 relays were reported as having "Other Defects", which were given a rating of 99.4 per cent. Those were certain minor defects we picked out that did not seem to fit in one of the other grades. I knew from the inspectors' reports what those defects were. They were all entered on these reports, and
316 from that we determined what relation they had to the total of the depreciated value, and assigned a value to them. The reason we have an odd fraction there is because they range from 99 and a fraction down to another fraction, and we just totaled them and averaged them all up here.

That is, we had three or four of those separate on the sheets, so we took a composite of those, and that gave us that odd average of 99.4.

The next component part, the seventh, message registers, is further broken down into the sub-parts: condensers, repeating coils, and resistances. These are not parts of the message registers, but in our study we picked out those four things because they are so similar, as far as wear or depre-
ciation is concerned—depreciation—and put them to-
317 gether. Then you see in the fourth column from the right
the ratio of each one of those to the total of that group. The ratio of that whole group to the total is 9 per cent. We broke that whole group down; you might say they were sub-component parts. For those component parts, I have four classifications: first, "good condition"; next, "marking illegible"; third, "missing or broken"; and then fourth, "other defects".

The lowest percentage assigned to any of those message registers, or things that are indicated here as associated with message registers, is 97 per cent. The explanation is that this entire equipment has practically no wear to it, as far as I can determine, and so according to my judgment I just set those three gradings arbitrarily, 99, 98 and 97, the first one representing 1 per cent depreciation, which I think from what I know about all that equipment, would take care of any possible general thing that was wrong with it; the sec-
ond would not take more than 2 per cent, and the third,
318 not more than 3 per cent. Those other defects were spe-
cific things; they were very minor—but again we entered them on these forms, and took off one or two points as shown there, to represent that depreciation or difference between them and "Good as New". It is my opinion that, as those percentages of course suggest, this type of equipment is scarcely subject to depreciation at all. The percentages that I have used represent my best judgment as to the amount of depreciation existing in those items inspected. These units shown here in the column "Good Condition"

were reported by the inspectors on the forms in a column "Good as New". Of the 216,000 message registers inspected, 206,000 were reported in that column "Good as New".

The next component element is cables, No. 8, on this sheet.

319 In the cables, we have three general classes. First there is the local position cables. Those are what we call hand-made forms; that is, they are made up by hand; loose wires are laced together to carry all of the circuits to the various equipment in the position; that is, the operator's position, the keys, the cords, the plugs, the lamps, and the operator's circuit. We examined a certain percentage of all of those position cables, and the first class was rated "Good as New", and I only took off 1 per cent depreciation for that, making it 99 per cent, because one can see the condition of those cables, and that seemed sufficient.

As bearing upon the high per cent condition in which I found the cable, the wire of each conductor of the switchboard cable, of course, is copper, and each wire is insulated, usually with silk and cotton. There is usually a little tinfoil, to
320 protect the wires from leakage from moisture, although of course we do not have moisture, or anything that is wet around those cables. Then there is a braiding over that, to take care of any abrasive conditions, of which we have very little, of course, except when the cable is first drawn over the racks. There is no braiding around the position cables, it is all silk and cotton-covered twisted wire, laced and shellaced—the shellac is the protection. We determined the condition of those particular cables by the shape they were in, especially the wiring. Taking the first grade, that is the grade where everything is all right, we could not consider really any depreciation there. The copper does not wear out, and the insulation, as long as it is not damaged, does not wear out. The only thing left was in the next column, where, when the wiring spreads out over the apparatus —that is when it is susceptible to damage, and then we took

off the graded depreciation. For the cable proper, I could see but very little that we should take off.

321 I think in probably every case, in most cases, at least, I consulted with Mr. Redmund before these ratings, or values that I assigned to these different grades, were made —that is they were not made until we had gathered the facts on these forms. Of course, I also knew about the facts, because I was close to them; so, before we placed or set up these ratings of the values, or the grades, Mr. Redmund and I discussed I think practically every one of them.

As regards the 493 local position cables inspected, this summary sheet shows 228 in the column "Good Condition", and 136 marked "Poor Condition", and a valuation of 80 per cent was given to those, the explanation being as follows:

You will notice that the worst condition was 70 per cent. If that cable was not fastened properly, and came loose, and was out of place, we considered that it would cost probably 30 per cent to put it in shape; that was not a depreciation of the wire, or the position of the cable, but
322 the arrangement of the cable in the position. The worst condition was 70 per cent. We had a condition between that and this other condition, of 90 per cent, that is, "Wiring Frayed"; we put in a half-way condition there, which is 80 per cent, or 20 per cent depreciation. This again is somewhat similar to the other method of carrying the depreciation down to a base. That is not an exact average but is based more upon my judgment of the conditions as we found them, and as we know they are liable to arise. It costs quite a little relatively to straighten up some of those cables.

The same principles and methods were applied to the reports on the remaining component elements. In view of the nature of the reports on the remaining component elements, I think that what I have already said may be taken as explanatory of these remaining component parts, with the possible exception of that first column, "Number Inspected"; in most cases, that refers to certain actual physical items. When we got down to No. 12 component part, storage batteries, we

reduced that to a different common denominator; that is,
323 we put all of those battery plates and tanks on a common denominator; the commercial rating which is ampere-hour capacity. This was done for the reason that storage battery plates vary in size in different batteries; therefore, I could not show merely the number of battery plates, and get a real composite on them, so I reduced that to the commercial rating, and that allowed us to weight them. Otherwise, I think I have covered all of the variations, the principles being just the same as I have described.

The footing of the final column headed "Composite" shows a total of 93.18 per cent. Then there is an adjustment, and a final footing "Per cent Condition for Manual Central Offices" of 91.41 per cent.

324 That adjustment by which I deduct 1.77 per cent represents the call circuit key equipment we found in the various offices which was not in service, due to change in practices, but was still on the books; so we had to arrive at some method to get that out of our per cent condition. Those are the call circuit keys that Mr. Redmund referred to in his testimony as one of the items of obsolete property found in the plant. He stated, as I recall it, that those were given a zero per cent condition. In arriving at zero per cent condition for those, we took the ratio of that equipment to the total, which is 1.9, in the second column from the right, multiplying that by the original per cent condition for central offices, as shown there, 93.18, which gives us a resultant of 1.77, which, subtracted from 93.18, gives the final per cent condition for manual central offices, 91.41.

325 On sheet 2 of this same exhibit, per cent condition of dial offices, I show the 15 component parts which make up dial offices, with the result of the inspection separately for each part. This sheet for the dial offices corresponds to the three columns having the same headings that are shown on the first sheet I have been explaining; they are the average percentage, the ratio of the total and the composite. I have shown here for dial offices what is shown for manual offices,

but have omitted all of the detailed summary of the inspectors' reports, and the various weightings. A sheet similar to that for the manual offices could be prepared for the dial offices from the data in my records that are here in Court. That simply has been dispensed with thus far because the methods and principles in the case of dial offices are precisely the same as in the case of manual offices. In
326 fact, most of the 15 component parts are manual parts.

There are only 5 of these 15 that are peculiar to the dial and all the other 10 parts are just exactly the same as manual. Sheet 2 shows in the last column that the per cent condition for total panel offices is 97 per cent. For dial offices of the step by step type, I show 96.64 per cent, and for the composite total for the dial offices, 97 per cent.

The next sheet, 3, is like sheet 2, and covers all so-called Long Lines central offices; the equipment at Morrell Park and the equipment at the Franklin Building is on page 3 and that at the Bell Building is on sheet 4, with a summary of those three Long Lines offices at the bottom of sheet 4.
327 For the boards and equipment of those three offices, an overall composite per cent condition of 96.45 per cent is shown.

The next sheet, 5, brings together the three sub-classes, manual, dial, and Long Lines offices, and weights those three to get an overall per cent condition for central office telephone equipment. The total account, as shown on sheet 5, is found to be in 93.86 per cent condition. On the original summary sheet which was identified by Mr. Redmund, Plaintiff's Exhibit A-22, the per cent condition for this Account 221, is entered for the year 1930 as 93. That figure actually found of 93.86 per cent was rounded out by dropping the decimal. We dropped the fraction in every case when we finally carried it through to the final account.

The next sheet, 6, of Plaintiff's Exhibit A-32, shows the results of the inspection of central offices for the class of property included in Account 222, and known as other
328 central office equipment. The three columns, "Per Cent Condition", "Ratio of Total", and "Composite", are

explained in exactly the same way that I have explained for manual central office equipment. They are mere computations as to putting them together; just the same method as the other.

The inspection of all the "Other Central Office Equipment" was made by myself in the offices. I arrived at the per cent condition for each office in this particular case, because this type of equipment is so variable that it does not lend itself to the counting of elements or items, like we did in central office telephone equipment. Therefore, in filling out the form "Good as New", "Fair", and "Poor", and other details, I would put in the percentage of each "Good as New", or "Fair", or "Poor", and then finally carry out the same method of multiplying, dividing by the total, and getting
329 the composite per cent for each item; then following the same method I have described for getting the overall per cent for the offices. I could readily do that because I handled that entire thing myself, and saw every article. Some of the items that enter into this account are: the operators' chairs, all of the furniture and fixtures in the rest rooms, the clocks, the fire extinguishers, certain test boxes, the operators' training school equipment (which we measured just the same as we did the manual, and then put it in the composite), electric fans, platforms (which was one of the big items), and platforms where the operators' chairs rest in front of the switchboard. As I have said, I personally made the inspection of this class of plant. I inspected every item, 100 per cent of this equipment.

The next sheet, which is page 7 of the exhibit, gives
330 the same data for dial offices and Long Lines offices, and then gives the composite summary at the bottom. Those at the top are the four dial offices. Then there are five different locations, where the Long Lines forces are. A composite per cent for all of the property in this Account 222, of 94.27, is shown in the final column, and that is carried into the overall summary, Plaintiff's Exhibit A-22, as 94 per cent.

331 Turning to the next sheet, page 8, Account 231, subscribers' telephone equipment: the heading shows that

1174 subscribers' stations were inspected. I think I have previously described how the ones to be inspected were selected by taking each office area and arbitrarily dividing it on a map into ten sections. Then, in the center of each of these sections, we picked out from our records a number of different classes of service in relation to the total of classes in that division. The inspector reported separately upon the condition of each of the component parts of the subscribers' telephone equipment, as shown on this summary sheet, and the figures show the number of each component part inspected, the summarization of the inspectors' reports with the depreciation values assigned to each, and generally the data cor-
332 responding to those shown on the previous exhibits. The method of arriving at it is just about the same; that is based on averages for each grade, taking a base and 100 per cent for the top.

The data for teletypewriter equipment are set forth at the bottom of page 8 of Exhibit A-32. Those averages for the different kinds of typewriters are arbitrary percentages based on my judgment of the condition of those different types. To the first type, Number 10, we gave a zero condition because that particular type was obsolete. It had been taken out of service and it had not been retired at that time. There
333 were thirty-two of those. They are the typewriters Mr. Redmund referred to in his testimony as a class of obsolete equipment. The composite per cent condition of the teletypewriter equipment was found to be 56.81 per cent. The figure 91.62 covers the subscribers' telephone equipment, composited with the teletypewriters.

Page 9 covers the inspection of subscribers' station apparatus as it was passing through the Western Electric warehouse on the in-and-out movement, to which I have already referred. Those are stations in connection with the movement of subscribers, not taken out because they are in trouble or worn or anything, but just in the regular course of business. No piece of equipment taken out in connection with our ordinary subscribers' movement is replaced until
334 it goes back through our warehouse and is worked over, to make sure when it goes back again it is just as good as

new. This inspection is the result of looking at that equipment before it has been worked over; it is just as received at the warehouse the day it came in. For the most part, these stations are taken out and go into the Western Electric warehouse because the subscriber has discontinued his service or has moved from one location to another, or changed to a class of service that might require a different type of instrument. The per cent condition covering this part of the inspection separately is 92.77 per cent, and that compares with the 92.61 per cent which was found as the condition for all of the subscribers' instruments inspected at the subscribers' premises. The note on page 9, at the bottom of the page, shows that this inspection at the warehouse was made for the purpose of checking the results of the inspection at the subscribers'
335 stations or subscribers' premises. It shows that it was very representative.

The next sheet, page 10, shows that station installations were inspected at 1919 locations. It shows the summarization of the inspectors' reports under several categories, and the per cent condition of 90.28 per cent. The inspectors' reports and the detailed summarizations are not shown here but are contained in the original papers which are present here in Court.

The next sheet, page 11, is an exactly similar sheet for Account 233, interior block wires. We have very little of that type of distribution in Chicago and, therefore, we did not need to inspect very much, but we think that it is a representative volume. What I have said with reference to the preceding sheet holds true for this inspection as well. All of the data are present here in the records in Court.

Sheet 12 shows the summarization of the inspection reports, and the final computations, as in preceding cases for
336 P. B. X. switchboards which were inspected on the subscribers' premises. These P. B. X. switchboards are broken down into component parts generally similar to the component parts of the larger central office switchboards. The multiple is very similar; the non-muntiple has the same elements in it and the cordless has fewer, but the same type of

elements as in our central office manual. We arrived at the ratings in the same manner. The large type of boards on subscribers' premises are the ones shown here, 17 manual multiple P. B. Xs. Those are practically the same as miniature central offices. Those are the boards at which the subscriber may have several telephone operators. "Multiple" means more than one operator. The non-multiple has one or two, but multiple has always more than two.

What I have said previously with reference to central office switchboards, and the type of inspection, and how I trans-
337 lated the inspectors' reports of general condition in the three categories into per cents condition, applies equally to this class of property, and if I were to cover this now I would be saying over substantially what I have previously said. The per cent condition for the cordless group is 94.87. The per cent condition for the non-multiple P. B. X. is 94.12. The figure at the bottom of the page is for the multiple manual P. B. X. only; the composite is on sheet 14. The
338 next sheet of this group of three, being page 13 of the exhibit, is another sub-class: the dial P. B. X. boards. The words "5 Dial P. B. X. Switchboards" on the left hand margin, at the center of the page, embrace all that appears on this sheet. That "5" represents five installations of that type that were inspected. The total in the last column, both vertically and horizontally, 97.81 per cent, is for that particular class. The next sheet, page 14 of the exhibit, brings all four of these classes together, consolidates them and shows the final overall per cent condition of 94.76 per cent for this class of property. In all instances the fraction has been dropped on Exhibit A-22.

339 Sheet 16 is similar to those that have gone before, showing the similar data for Account 235, booths and special fittings. That is ranged in four grades, the fourth grade being zero condition, that is, zero per cent; that is a computation, really; the base there is on the poor condition, just the same as we treated the others, but in our study, arriving at the cost, we found that a certain percentage of these booths when returned in connection with the regular movement were

not economically reparable, that is, the repairs were excessive. Therefore, they were junked and we have allowed for that by considering that number would have been in zero condition. That does not mean they were not subscribers' stations working, it does not mean they were obsolete. It merely means if they had come back in the regular course, that number would have been rated at zero. So, we have carried that out in this calculation. That is a little different from the others. There were 43 of these.

340 The next sheet, which is page 17, covers exchange aerial wire, Account 243, and shows a per cent condition of 84.39 per cent, arrived at by a method similar to the others.

The last page of this exhibit shows similar data for the class of property designated Account 274, entitled, "Miscellaneous Account", and, so far as I can see (except for the property rights to which I have assigned Mr. Riley's percentage for conduit, as it constitutes the right to use con-
341 duit in the Union Depot), is self-explanatory. I personally made the inspection for this class of property.

The results that I have testified to and that are shown by the exhibits are those obtained as of the year 1930, because in getting our ratio comparison we used Mr. Sloan's reproduction costs as of December 30, 1930.

I have testified concerning my long period of service in the telephone business, and have shown that it has been related to the class of property covered by my inspection, in the various capacities in which I have had to deal with it. I have also testified that I have been, in the regular course of my duties, familiar with the property that I inspected as of 1930 and its maintenance and operation. Taking all that knowledge of the property from my day to day familiarity with it throughout these years, together with my knowledge of its construction, methods of maintenance, and the condition in which it is maintained, together with this inspection and the results
342 of it, as shown, into consideration, I have been able to form a reliable judgment as to the condition in which these same classes of property were during the years intervening between the inspection made in 1923 by others, which

was testified to in this record upon the other trial, and the inspection made by me as of 1930. I think my close connection with those particular classes of property during all that period put me in a position to determine in a reasonable way what the percentage condition was at those different periods. I think the per cent condition for each of the classes of property inspected by me, as shown for each of the years on Exhibit A-22, is very representative as to the condition of the property throughout the period and for each of those years.

I have specifically referred to two cases of obsolete property which I found in the plant covered by my inspection. There were only three such cases, the third being in the subclass "Long Lines", and was taken care of in the summary
pertaining to that class. I have not specifically referred
343 to it in the discussion but it shows in my exhibits. It
was the carrier telephone equipment at Morrell Park, which was referred to by Mr. Redmund in his testimony.

I did not find any inadequate property in all that inspected by me.

I think the per cent condition for the year 1931 is just about the same as that found for 1930. I do not think there have been any changes of any size that would cause me to think there should be a different per cent condition for that year.

I heard Mr. Redmund's testimony referring to central
344 office equipment, which is shown on Exhibit A-22 to be
in 93 per cent condition in 1930 and in 1929, and uniformly 92 per cent condition for each of the preceding years back to and including 1923; I also heard Mr. Redmund's testimony referring to private branch exchanges, which were covered by my inspection and as to which there is a variation of condition, somewhat gradual, as shown by Exhibit A-22, from 94 per cent condition in 1930 back to 88 per cent condition in 1923; I also heard Mr. Redmund's testimony referring to booths and special fittings, Account 235, as to which a generally similar situation is shown by Exhibit A-22, the condition in 1930 being 85 per cent and gradually lower for the preceding years, reaching a low point of 78 per cent in 1923.

I subscribe to all of Mr. Redmund's testimony with reference to these three classes of property, and to his explanation of that situation. In fact, Mr. Redmund and I discussed this matter together and arrived at certain conclusions.

There was thereupon offered in evidence Plaintiff's Exhibit A-22 and each of the later exhibits down to and including A-32, and each of them separately. Defendants reserved
345 their right to object to these exhibits until the cross-examination.

346 B. T. YOUNG, called as a witness on behalf of the plaintiff, having been first duly sworn, was examined and testified as follows:

Direct Examination by Mr. Bracelen.

My name is B. T. Young and I live in Evanston, Illinois. I am an employee of the Illinois Bell Telephone Company and have been since November, 1912. This period covers my entire experience in the telephone business.

I was first employed as a draftsman, and several months later was transferred to the Building Department as a draftsman and junior engineer. That work was continued, with some added responsibilities, to the present time. During that period, I have actually worked on the drawings and
347 specifications, and assisted in the erection of 18 of the 41 buildings. During the same period, I have done the same work also on alterations and additions to the balance of the buildings. Throughout, my employment has had to do with buildings, and my work over this period of years has made me familiar with the buildings covered by the inspection about which I am to testify.

I had charge of the inspection of the buildings under the general supervision and direction of Mr. Redmund. I made the inspection myself, and have prepared a report of it, which has been marked for identification as Plaintiff's Exhibit A-33.

The exhibit has the legend on the cover "Report on condition as of 31st December, 1930, of all buildings owned by the Illinois Bell Telephone Company in Chicago, Illinois." The

first sheet of this exhibit is the summary sheet, showing in the first column each of the buildings by the designation by which it is known. The second column shows the per cent which
348 each of the buildings is of the entire group of buildings; the third column, "Estimated per cent decrease in condition" for each of the buildings. The fourth column shows "Per cent to be deducted from condition of entire group." The figures shown in the last three columns are correct. The figures in the column showing the per cent which a given building is of the entire group of buildings were based on Mr. Renwick's appraisal, which has been testified to, and it is in evidence here. The percentage figures in the next column state the amount of depreciation found for each building. The figure in the first column, multiplied by that in the second column, gives the result shown in the third. The final
349 figure in the last column, which is 6.350, if deducted from 100 per cent, gives the per cent condition of the entire group of buildings, which is 93.650, as shown at the bottom of this sheet.

The second sheet shows the results of my inspection of the Austin Building, which is shown first on the summary
350 sheet. There is a similar sheet for each of the buildings. Taking now the sheet for the Austin Building, the legend at the top gives its location in the City, indicates its type of construction, which, in this case, is reinforced concrete on spread footings, and gives the reconstruction cost as a percentage of the reconstruction cost of the entire group. The entries in the column headed "Item" indicate the component parts into which the building was broken down for inspection.

The second column shows the per cent which each component element is of the entire building. These we arrived at by using component parts, following very closely the work done by the various contractors. It was, therefore, possible to determine very accurately, for instance, the average cost of the electric wiring in our buildings, and so on down through the various items, such as glazing, heating and ventilating, lathing and plastering. Those varied somewhat in the various

buildings. For instance, for a building containing elevators, the various other percentages would have to be reduced proportionately in order to build up to the 100 per cent, so those values are not constant throughout, but are very nearly so.

351 The next column, headed "Estimated per cent decrease," shows the amount of depreciation found, stated as a percentage, for each of the component elements of the building. The last column at the right margin of the sheet is the computation which I have already explained. That is, the per cent decrease in the total building, which, footed up at the bottom and subtracted from 100, gives the per cent condition of the building.

In explaining about my inspection of the buildings, I will use the Austin Building as an example.

I inspected every part of it; that is, the roof, penthouse, all of the exterior, and every room of the interior. In the case of electric wiring, for instance, all of the switches were operated to see if they performed their function. Fuse cabinets and any part of the wiring which it was possible to get at were inspected and any defects or wear was noted. In the case of exterior ornamentation, I noted any cracks or severe weathering of the stone, terra cotta, marble, or whatever

352 the ornamentation consisted of. All of the windows were inspected for broken glass, and for the condition of the putty or strips holding the glass in place. All of the finished hardware was inspected; that is, the door locks, butts, and so on, and movable parts. The heating and ventilating system was gone over; the boiler first was inspected for cracked covering or broken grates, or broken gauge glasses, and so on. Then the entire system was gone over as to the radiators, valves, etc. All of the pipe covering was inspected and the pipe, where exposed, was gone over. The lighting fixtures were easily inspected for breakage, deterioration of finish, or dented or damaged pieces. The lathing and plastering was, of course, visible in all places for cracks and loose plaster. The interior marble, slate, and so on, in the vestibules and toilet rooms was inspected for cracks and chips. The metal

doors and frames were all operated to see whether they were bound in place or operated easily, or if there were any dents or broken parts that detracted from their condition. The windows were inspected in the same way, and the sash, where practicable, were opened and closed to see whether they operated properly, and that all the sash chains were in position.

The millwork and carpentry was all inspected to see
353 whether there was any of it damaged, broken, or badly scarred. The ornamental metal and miscellaneous iron was inspected for broken, bent or entirely missing pieces. The painting and decorating was looked over to note the need for redecorating, or for any particular damage to the outside painting.

The plumbing, drainage, and gas fitting was gone over in somewhat the same manner as the heating system. All of the movable parts, that is, flush valves, faucets, and so on, were inspected for worn or broken parts, each outlet being operated to see whether reasonable pressure was delivered to the various fixtures.

The roof in each case was inspected to see if repairs or recoating was necessary. The structures, depending on the type of construction, particularly the outside walls, were noted for signs of settlement, also the underside of the floor construction; the columns and the structural members were inspected where they were exposed. That included the masonry. The outside walls were looked over to note the necessity for possible repointing of mortar joints.

The tile partitions inside were inspected for possible shrinkage, and the fire-proofing on the columns and structural members was inspected for cracks and broken pieces.

The items noted were simply the specific things that
354 could be put down to serve as a guide for my estimate of the condition of that component part. They were considered separately, and a per cent decrease in condition assigned to each of them. They were then totaled, giving a total deduction for the building. In each case, after several buildings had been inspected, and I had arrived at my conclu-

sions, I reviewed them with Mr. Redmund. In each case, he concurred in the final finding that I had made.

When I referred a moment ago to those things that are set down, I referred to the specific notations made on the sheet in the column headed "Reason for Deduction". These were used as a guide, along with the overall results of the building as a whole, in arriving at the per cent condition.

The valuation of these factors of depreciation for each
355 component part was purely a matter of personal judgment. There is no scale by which we could be guided. As I have stated under "Reason for Deduction", I noted the particular faults I found. At the same time, I had gained an impression of the condition of, for instance, the exterior ornamentation as a whole. The impression that was made on me it would make on any other engineer or architect that might examine it. That is my best judgment as to the amount that might reasonably be taken from the 100 per cent condition to describe the condition I found. The abbreviations which I have entered under the heading "Reason for Deduction" are explained in the sheet pasted on the cover of this exhibit.

Exhibit A-33 was here offered in evidence by plaintiff. Defendants reserved objections until after cross-examination.

356 The condition of the buildings as shown by the exhibit is that found as a result of my inspection, and has reference to the end of the year 1930. As a result of my day to day familiarity with these buildings, gained in connection with the discharge of my duties and my employment throughout the years 1923 to date, and my knowledge of the Company's standards of maintenance of its buildings and the extent to which the standards were adhered to or departed from throughout the years, and my knowledge gained from this inspection, I believe that approximately this same condition might reasonably be assumed to have obtained over the preceding period from 1923 to date, and the period immediately after the inspection. I have been in all of these buildings numerous times during the various years, and have always found them to be, without an inspection, in approximately

the same condition that I found them at this time. They are maintained, as every other class of the Company's
357 property is maintained, by repairs and replacement of parts as they wear out. For instance, if the boiler becomes used to a point where it needs renewal of parts, that is attended to as a matter of maintenance. The condition of the buildings to date and during the time since the inspection was made is, in my judgment, substantially the same as shown here for the end of 1930.

MAYNARD H. RILEY, called as a witness on behalf of the plaintiff, having been first duly sworn, was examined and testified as follows:

358 *Direct Examination by Mr. Bracelen.*

My name is Maynard H. Riley and I live in Winnetka, Illinois. I am in the employ of the Illinois Bell Telephone Company and have been since 1912. I started to work for the Central Union Telephone Company at Indianapolis in 1905, in the Engineering Department, and was with that Company from 1905 to 1912. I have been continuously engaged in the telephone business since 1905. The Central Union Telephone Company was a Bell Telephone Company. I am now Superintendent of Construction and Plant Engineering.

359 After employment with the Central Union Company in 1905, I was appointed division engineer for the Illinois Division of the Central Union Company in 1911, with headquarters at Springfield, Illinois. In 1912 I came to Chicago as facilities engineer for the Illinois Division of the Central Union Company, and the Suburban Division of the Chicago Company. In 1914 I had the same position for the Suburban Division of the Chicago Company and the Chicago area. In 1920 I was made Plant Engineer for the Chicago area, and held that position until 1925, when I was appointed to my present position. From 1920 to 1925, during which time I was Plant Engineer for the Chicago area, I had

charge of the engineering of the outside plant for Chi-
360 cago. From 1925 down to date, I have had the same
duties, with the added responsibility for outside plant construction and maintenance. My jurisdiction has been confined to the Chicago area, that is to say, the City of Chicago, from 1914 down to date.

Under Mr. Redmund's general supervision and direction, I had charge of the inspection of all of the outside plant accounts in Chicago with the exception of exchange wire, which Mr. Hyatt handled. That included the pole lines, aerial cable, underground conduit, underground cable, submarine cable, and the toll accounts for the same classes of property. I had altogether about 30 inspectors to make this inspection under my direction. Ten of these were district plant engineers that I had inspect pole lines. Another ten were construction foremen, of experience and ability in the classes of plant which
they were to inspect, which was underground conduit,
361 that is, the manholes, the underground cable, and the
building cable. Then I had ten other inspectors, consisting of linemen, who were perfectly familiar with that class of work, to inspect the aerial cable and terminals.

After deciding upon the amount of inspection of each different class of plant, jointly with Mr. Redmund, I determined upon the methods of selection of different classes of plant, in order to insure a uniform spread of inspection, and a typical cross-section of each class of plant throughout the City. Generally, that was done by blocking out the City in areas varying in size from about a mile by three-quarter mile square for pole lines to quarters of office areas for aerial cable. The purpose of that was to divide the total quantity of plant in each class proportionately. By blocking it off this way, and taking a uniform amount in the center of each block area, we were able to obtain a very uniform spread, and what I believe to be a very typical cross-section of the different
items of plant. The units of the plant to be inspected for
362 the building cable inspection were selected somewhat on
that basis, by taking every tenth city block. Each city block in an office area is numbered, and by taking every tenth

block and getting the records of the building cable in that block, we obtained a sufficient amount of building cable to meet our requirements for the inspection uniformly through each office area.

Page 1 of Exhibit A-34, which is marked on the cover, "Account 241, Exchange Pole Lines", is a copy of the form which was put in the hands of the inspector, and upon which he made the report of his inspection.

I have here in Court, laid out on the counsel table,
363 some 84 volumes or folders. These are the original records, including original reports, turned in by the inspectors, and the various summarizations and computations involved in each inspection.

The inspectors of pole lines stated their conclusions in terms of per cent condition for each pole, cross-arm, anchor and guy which they inspected, on the ground. That is the only instance in which that was done, in this inspection. The account with which we are dealing groups the pole itself, cross-arm, anchors, and the guys together as one class.

Page 2 of this exhibit is a summary of total poles,
364 cross-arms, anchors and guys inspected, summarized by district areas. That is, the original inspection sheets were summarized by districts, and transferred to this sheet, totaled up to a final summary on the bottom of page 2, for Chicago as a whole. The first column, headed "Joint", indicates the inspection of poles held in joint ownership between the Illinois Bell and some other company. The second column, headed "I. B. T.", shows poles owned 100 per cent by the Illinois Bell Telephone Company. The initial letters in the left-hand margin are district area designations, "ER", for instance, meaning the Edgewater-Rogers Park area. The word "Penetration" at the head of the third column is the designation of a method of inspection whereby we determined the amount of rot at the base of the pole, and used that, together with what could be observed visually about the condition of the pole, in the calculations for the condition of the pole.

365 There were so many of our poles set in pavement, and

such a very large percentage of them were butt treated (all the poles set in the past ten years have been butt treated, in which case we find no rot), that we were only able to get at the base of the pole to determine the amount of decay in a little less than 12 per cent, I think it was, of the total poles inspected. The rest of them were inspected visually, and by sounding the pole, and looking at the damage, and other things that might have occurred to it. The paving preserves the base of the pole, and prevents rot. Ordinarily we could not make the inspection by the penetration method where the pole was set in pavement without great expense, which seemed unreasonable in a case like this. During the past ten
366 years, during which period all poles have been butt treated, poles equaling 56 per cent of the total number have been set.

367 Page 2 of Exhibit A-34 is a sheet summarizing the reports of the inspectors for the poles, arms, anchors and guys, and is continued on the next page with the footings for the entire City of Chicago at the bottom. This sum-
368 mary consists simply of an arithmetical addition of the inspection sheets. Page 4 shows how the results of the inspection were translated into the final condition per cent for this class of property. The first main heading at the top of this sheet shows the total number of poles in the plant as divided between those wholly owned by the Illinois Bell Telephone Company and those partly owned, which are designated as joint poles, and similarly shows the total number of arms, anchors and guys in the plant.

The next main heading shows the total number of these items inspected, so that the relation of those inspected to the total number in the plant can be derived arithmetically from these facts. In the fourth column, under the heading "Sum of condition per cents after conversion of joint
369 poles to whole units", is shown simply a conversion of the sum of the conditions of joint poles inspected to the equivalent of whole poles by dividing by two. All but about 100 of these joint poles are owned on a 50 per cent basis, so we divided them by two and added it to the sum of the condition

of the wholly owned poles. Similarly, the number of joint poles inspected was converted to a whole pole unit basis by dividing by two and adding the result to the total wholly owned poles inspected. This was done to give a 50 per cent weighting to the joint poles because the Illinois Bell Telephone Company had only a 50 per cent ownership in those poles. The average per cent condition from inspection is a straight arithmetical average.

The figures in the third from the last column, "Book Value as of September 30, 1930," were taken from the books,
370 but required a computation to divide the poles, anchors and guys; those two items are contained in the same amount, as I recall it, and we had to make a computation to divide those two. This computation was made by one of my plant engineers for me but under my direction.

The final overall per cent condition of 78.46, shown in the last column, was derived by multiplying the average per cent condition for each item by the per cent of total account, shown in the next to the last column, thus obtaining the average of the three. The fraction was dropped and 78 per cent used and carried forward for this class of plant into Exhibit A-22.

Exhibit A-35 covers Account 242, Exchange Aerial
371 Cable. The first sheet is the form that was placed in the hands of the inspector, to be filled out by him upon making the inspection of each unit. Terminals, the unit designated in the first column of this sheet, are the boxes located at the points where pairs in the cable are brought out for distribution; they are provided so the wire can be gotten at. These boxes are attached to poles. There is not quite one terminal to every pole, but almost every pole has a terminal. The large majority of poles have them. A span is the length of cable between two poles, and averages about 100 feet of cable.

The next section of this sheet, that is, columns numbered 3 to 7, indicates the specific defects which the inspector
372 was to make a record of. The defects designated there are all of the defects we are accustomed to encountering in maintenance work. We designated all of the things that

we thought would affect the condition of the cable, and these are all of the things that we normally encounter in connection with our maintenance work.

The sheet would indicate that column 8, rings slipped, broken or rusted, is related to the cable. As a matter of fact, it is related to the strand, and was so treated by me. Of course, that mistake in the report sheet made no difference whatever to the inspectors. It was a mistake in the printing and rather than have it printed over again, we explained it to the inspectors, and they reported it correctly. The strand
is the wire which supports the cable. The rings are
373 attached to the strand and the cable is placed through
them. I have listed on this sheet all of the defects that I would expect to find in the inspection of terminals.

Pages 2 and 3 of the exhibit (A-35) are the arithmetical totals of the corresponding column footings of the inspectors' reports, with the exception of column 19. In that column the inspectors' reports show "Size of Terminal," but on the summary sheets that was converted to "Number of Binding Posts". We were able to determine the total number of binding posts shown in column 19 on page 2 from the inspectors' reports showing the size of terminals, because the size of the terminal determines the number of binding posts. There are two binding posts to each cable pair, so that it is very easy to obtain the total number of binding posts from the size of the terminal.

Page 4, the final sheet of this exhibit (A-35), shows for
374 cable a 2 per cent depreciation on account of the defects
to the sheath reported by the inspectors. After considering the quantity and quality of the defects reported in relation to the total amount of cable reported, and also considering the cost of repairing those defects, we arrived at the final conclusion that 2 per cent would be an ample allowance to take care of the depreciation of the entire sheath. We estimated that the total defects, with the exception of the extra sleeves, shown on the summary sheet, that is, the sheath injuries, temporary taped openings, cable bows, and broken ties, could be repaired at an average cost of $5 each.

There are 377 of those defects in 6 per cent of the cable, averaging approximately 6,300 for the entire cable, which at $5 each would cost about $30,000 to repair. That would amount to about 1 per cent of the entire cable cost. Then, for whatever effect the extra sleeves might have on condition,
375 and for any other wear which might not have been readily observable on inspection, we allowed another 1 per cent. You see, these inspectors climbed only the terminal poles to inspect the cable closely at the poles. The rest of it they inspected from the ground, by walking along under the cable. Extra sleeves are called "Extra Splices" in the summary sheet in Column 6. The effect of those extra sleeves or extra splices was taken into the 2 per cent depreciation.

Now, in the next column of this summary sheet (page 4, Exhibit A-35), under the headings of Per Cent Depreciation and Other Allowances, there is a figure of 2.77 per cent for defective pairs. That is the percentage of cable pairs defective and not in use related to the total cable pairs in the aerial cable, as determined from a study of our office records. The cable was treated as being 100 per cent impaired to the
376 extent of the defective pairs, in relation to the total number in the cable. Defective pairs mean wire conductors not functioning at the time. The sizes of aerial cable average all the way from 25 pairs to 100 or 150 pairs for normal distribution. We have a few larger sizes. The sheath is the lead sheath, as in the case of other cables.

The total per cent depreciation for cables, shown in the next column, of 4.77, is the sum of the 2 per cent for sheath defects, and the 2.77 for defective pairs. In the next column, headed "Per cent depreciable value allowing for net salvage" and lettered (b), is the figure 82 per cent for cable. We figured that there was a point beyond which the cable
377 would not depreciate, because of its junk salvage value. We made an estimate of the net salvage as junk, after allowing for the cost of removal, and found that to be 18 per cent, which we subtracted from 100, leaving 82 per cent as the depreciable value of the cable. Therefore, the per cent condition found from sheath defects and defective pairs

should be applied to the 82 per cent depreciable value. That is worked out in the next column, entitled, "Per cent depreciation allowance", showing for aerial cable a depreciation allowance of 3.91.

The second item on this page (page 4, Exhibit A-35) is strand and rings, and shows in the fifth column a 46 per cent allowance for defects. The summary sheets show under "strand" two items: "slightly worn or rusted" and "badly worn or rusted." If the strand was good, no entry was made, so that the good strand could be determined from the difference between the total amount inspected and the sum of the two columns shown here. As the result of that inspection, we found that out of 6,240 spans inspected, there were 2,809 good spans, 1,418 slightly rusted spans, and 2,013 badly
378 rusted spans. We also found that about half of the rings were reported to be rusted or slipped, and we figured that that was approximately the same percentage as the rusted strand to the total span, so we considered both of those items together, rather than condition them separately. We considered strand in three general classifications: good, medium and poor condition. We assumed that the good strand would fall in the range of the class of 66 per cent to 100 per cent, or one-third, and gave it a condition of the mean between those two points, or 83 per cent. Similarly, the medium strand fell in the range of from 66 per cent down to 33 per cent, or an average of 50 per cent. The badly rusted strand, or that in poorest condition, which fell in the range of from 33 per cent to zero, was given an average of 17 per cent. Those percentages applied to the number of spans of strand found defective for each classification, and divided by the total number of spans inspected, gave an average of 54 per cent condition for the entire strand.

379 The next item is terminals, for which the per cent condition figure is shown in column 8. This also was found by considering carefully the results of the inspection for each different class of defect found, and estimating about what effect such defect would have on the total terminal, and estimating a depreciation allowance for each of

those defects from that. Take, for instance, the 135 cable tails, as they are listed on page 3, that is the number of cables from the terminal boxes to the main cable, which were found kinked, cracked or injured. Most of those injuries were slight, but we allowed a depreciation of 20 per cent for each. That is our best estimate of what the effect of those defects would amount to as an average. Then we worked that out as a depreciation allowance on all the terminals for that particular defect, by taking 20 per cent for each of the 135 defects, divided by the total number of terminals inspected, 4,762.

That gave a depreciation allowance of .57 per cent for
380 that particular defect. The other items in that column were worked out in the same manner. We considered the 99 housings listed as broken as having a more serious effect than those rusted, and allowed a higher depreciation rate, which was 30 per cent. For housings rusted, and for the next item in the summary sheet of 48 cracked, broken or missing covers, we allowed 5 per cent depreciation. This was based largely on the fact that it would cost about 5 per cent of the cost of the terminal to paint or replace the cover, and take care of those defects. For the 122 face plates cracked, we allowed 20 per cent average depreciation. These cracks ran all the way from small slight ones to some rather bad ones. Out of a total of 149,450 binding posts inspected, there was a total of 1,828 binding posts found defective in some way. As most of these binding posts shown on the inspector's report as defective had just a small amount of corrosion, and could be easily cleaned, we allowed 25 per cent depreciation

for each binding post, and obtained the depreciation
381 allowance of .31 per cent. These all totaled to 3.19, and then we made a total allowance of 4 per cent depreciation on terminals.

I think we only have 10 load coils and cases (the last item on page 4 of Exhibit A-35) in the exchange aerial cable plant. I do not think we found any of them on inspection, but we gave a depreciation allowance of 2 per cent to cover any rust that there might be in the pots, or any other defect in the cable tails from the pot to the cable. It is rather an arbitrary

allowance, but I think it is ample to cover any depreciation that might possibly be found in them. That is the item of $5,000 for the entire plant in the City of Chicago.

The per cents for depreciation for the various defects and impairments found, as shown by this inspection, in this case and in all other cases covered by my testimony, are deemed by me to be reasonable, fair and adequate allowances. I
382 found, as the result of totaling these figures on the summary sheet, page 4, a composite per cent condition for this class of plant of 88.92 per cent, and carried that forward into the final summary at 88 per cent.

383 The first sheet in Exhibit A-36 covering Account 244, Exchange Underground Conduit, is the inspector's report form. The last three horizontal columns of this sheet, under the head of Conduit Sections, were not used in this inspection. We provided these columns for the inspection with the hope that we might be able to obtain some information about the conduit sections on the inspection; but it was found to be almost impossible to get enough to be of any use. This sheet required the inspectors to report all of the defects or impairments in the manholes that would be encountered in our maintenance work.

The next sheet, 2, is a summary of the inspection reports for manholes. The sheet itself indicates a summary of
384 conduit, but that relates to the part of the report form that was not used. As I have just explained, this section, columns 23 to 30, was put in for such information as we might be able to secure on the ground. A part of this information was expected to be obtained from the inspection report of underground cable, covering dead cable stuck in the ducts (this is an item which we will come to later, where also we found we could not do anything with it and it was omitted from this summary). Whatever we could find in the manholes concerning the last three items on the inspection report (sheet 1) is actually summarized on this summary report in columns 21 and 22, I think: Ducts, Breaks. Page 3 is a continuation of the summary, with the final footings

385 on that sheet. These are merely arithmetical additions of the facts reported by the inspectors.

Sheet 4 (of Exhibit A-36) is the inspector's report form for lateral conduit, underground terminals and standpipe, and so forth. The next sheet, 5, is a similar summary of the reports of the inspectors made on that form. Sheet 7, is a final summarization and conversion into per cent condition of the inspection covered by both of these forms for both of these sub-classes of plant that I have referred to. Here again the problem is to evaluate the defect, and then state it in terms of per cent of depreciation, in relation to the man-
386 hole or terminal or conduit wholly unimpaired and as good as new. After breaking the manhole down into the elements or parts which we were to inspect, such as walls, roofs, floors, frames and covers, and cable racks, we figured out from our retirement unit costs the average cost of an average manhole for Chicago. That cost was then broken down into the component parts which were to be inspected, and we found that the percentages are as shown in the column entitled "Ratio of component parts to total subclass". That is, the walls would constitute 34.5 per cent of the entire cost for the manhole, roofs 11.5 per cent, and so on down.

Then, having found the number of defects in each part of the manhole, which, from the inspection forms and notes thereon, were classified as minor and major defects, we assumed that a major defect in any one of these parts would be of sufficient importance that we would allow 100 per cent
387 depreciation for that part. Therefore, as in the case of a wall, for instance, there are four walls for a manhole, and the percentage of walls to the total manhole was 34.5, and we allowed about one-quarter of that or 9 per cent depreciation for a major defect in the wall. That is, if any wall had a severe or major defect, as shown by the inspector's report, that was treated as a 100 per cent depreciation. We allowed 50 per cent of that, or approximately a little less than 50 per cent, for each minor defect in each of these classes. The allowance for minor defects all through here is just a little less than one-half the allowance for each major defect.

That is all related to the percentage of the component parts, and the basis of 100 per cent allowance for major defects. By multiplying out the defects found by the depreciation allowance, we arrived at a per cent depreciation for each part, which, summed up, makes a total depreciation allowance of 2 per cent. The computation method I have just described
388 is, I think, a very reasonable one, and makes ample allowance for any depreciation to be found in manholes.

What I have said for walls of manholes is descriptive also of what was done in the case of roofs of manholes, and the floors, frames and covers and cable racks.

The tunnels listed on this page (page 7, Exhibit A-36) are under the river in Chicago, and contain conduits and cables. We have five of them. One is under the Chicago River at La Salle Street, and is owned jointly with the Edison Company. We were unable to inspect these tunnels in this inspection without spending quite a good deal of money to pump them out, because they are usually full of water; so we
389 relied upon information about them that some of our men have had from the last time they were inspected. I have seen most of them myself. They are all in good condition; so we allowed the same amount that we allowed on the conduits, 10 per cent, and made them 90 per cent condition. In so far as actual visual inspection of those tunnels is concerned, I have only such information as has been obtained when they have been pumped out from time to time in the course of maintenance work.

The next component part of exchange underground conduit is the conduit itself. The Camp tile is a single clay tile, of which we have a very small amount. It was laid quite a good many years ago, but is in excellent condition, very well constructed, and protected with a complete concrete encasement. We never had any trouble with it. The McRoy conduit is the multiple and single vitrified clay conduit which we now use and have been using for a number of years, and which
390 constitutes by far the largest amount of our conduit, as will be seen from the figures showing the number of duct feet. That type of conduit has been excellently constructed,

and is of a very substantial structure. We have had very little trouble with it. Almost all of the trouble we have had, has been as a result of damage to it rather than from any defects in the conduit itself, or in the construction of it. The second entry, reading across the page, shows 86.23 per cent, which indicates that this type of conduit (the best type that I have been describing) constitutes 86 plus per cent of all the conduit. The other types of conduit shown below the McRoy and Camp tile are older types, and, while we have relatively small amounts of them, we have given them a rather high depreciation, particularly the 10 by 10 type, which
391 is a clay conduit; it is not a very substantial structure and not very well constructed. As a result, that conduit has broken down in a great many places, and settled, and is out of line; it is not in good shape, so we allowed 85 per cent depreciation for that.

Probably the worst type of conduit we have is the paper pipe, which also is in very bad condition, crushed. While a good deal of it is in use, there is not much of what is not in use that can be used; so we allowed a rather high depreciation rate on that. There is somewhat less than 1,000,000 feet of this conduit, and we have depreciated that 95 per cent. That is the paper conduit which Mr. Redmund referred to in his testimony as being considered obsolete.

The first sheet of Exhibit A-37, which covers Account 245, exchange underground cable, is the inspector's report form for the subscribers' and trunk main underground cable.

What I have said with respect to the listing of the points
392 to be made note of by the inspector for the previous exhibits, holds good for this sheet also.

The next sheet, page 2 (Exhibit A-37), is the summary of the inspectors' reports. So far as the cable sheath itself is concerned, this summary sheet is similar to the one described a while ago in Exhibit A-35. It covers about the same class and character of defects. A bond is the point at which each of the cables is tied together in the manhole, for electrolysis purposes. The loading consists of the load pots and load coils in the trunk cables contained in the manholes. We have

here in this summary sheet the facts respecting the dead cable to which I referred a moment ago.

393 Sheet 4 is the inspector's report form for the items shown there. Sheets 5 and 6 contain the summary with the column footings on page 6. Sheet 7 is the inspector's report form for building cable and terminals. Building cable and terminals include only the cable inside of the building. Sheets 8, 9, 10, 11 and 12 are the summaries of the inspectors' reports for building cable and terminals, with the final footings on page 12.

Sheet 13 shows the method by which the summarizations of defects reported were converted into the per cent condition, and sheet 14 is the same thing, having been added because it was large and could be read more easily.

394 Every tenth manhole was inspected, and this sheet 14 (of Exhibit A-37) shows, in the second column, that the main subscribers' cable was inspected at the time of the inspection of the manholes. For sheath defects of main subscribers' cable, sheet 13 and sheet 14 show depreciation amounting to 1.5 per cent, which was arrived at in about the same way that I described for aerial cable. Then there

395 is a depreciation of 1 per cent for electrolysis. We could not secure enough information about electrolysis on the inspection to satisfy us, but we found that we had a record of some 1,400 odd sections of cable which had been removed in the past 4 or 5 years, on which we had some very thorough reports of the condition of electrolysis found by close inspection of those removed cable sections. We also had records showing the cable section replacements and repairs due to electrolysis, and in both cases it showed a rather small amount, compared with the total, of sheath deterioration due to electrolysis. From these figures, we arrived finally at 1 per cent as being a very reasonable allowance for electrolysis; that is a fair allowance for the sheath depreciation since that is all it affects. We found a depreciation of this class of cable for defective pairs equal to 2.5 per cent. What I said about defective pairs in another connection a while ago applies

396 equally here. The 5 per cent total depreciation for main subscribers' cable is the sum of the depreciation per cents

that I have referred to, namely, 1.5 per cent sheath defects, 1 per cent for electrolysis, and 2.5 per cent for defective pairs. The next column, "Per cent depreciable value allowing for net salvage," is shown to be 75 per cent. The explanation for that is the same as I have given in other similar cases in my testimony.

The next sub-class is trunk cable. The explanation that I have given heretofore applies equally here. Instead of 5 per cent, as in the case of main subscribers' cable, we get for the trunk cable 4.8 per cent. This is due to the fact that the defective pairs here are 2.3 per cent, instead of 2.5 per
397 cent, as shown by our records for defective pairs of main subscribers' cable.

The next sub-class is subsidiary cable. My testimony for similar property in another sub-class is fully explanatory of this.

The next sub-class is building cable, which shows sheath defects of 1 per cent. In this case we found relatively few defects. When we got through with the inspection, we had a good picture of the condition of the cable from the number and character of the defects shown; and this represents my best judgment as to what the depreciation allowance should be for sheath defects in building cable. We did not relate the defects to any figures of cost or repair, because there were not enough of them. I think that this is a fairly liberal allowance, considering what we found upon inspection. Here
398 the defective pairs were 1.4 per cent of the total pairs in the cable, and were treated in the same way as I have already described in other cases.

We arrived at 2 per cent depreciation for the final sub-class of terminals in practically the same way that I described for sheath defects. That is, we made no attempt in this case to break that down and assign depreciation values for each character of defect found in terminals, because there were relatively so few defects shown. Rather than that, we assigned what seemed to be a reasonable amount for the overall amount of defects found.

We got a condition per cent, as a composite, for the entire

class of exchange underground cable of 96.32 per cent, from which a deduction of 1.32 per cent was made. Thus we
399 obtained 95 per cent, which was carried forward, for this class of property, into Exhibit A-22. This deduction was more than the mere dropping of a fraction. There were some things in here that we had not cared for in the other computations. For instance, there were extra sleeves on the cables in manholes that we had not made any allowance for. It is rather difficult to say just how much allowance should be made for these things and for duct splices, also, there was some dead cable stuck in the ducts (representing about .14 of 1 per cent, as I recall it, of the total cable account, and which, of course, should be given zero condition). We felt that some allowance should be made for these things, and for the fact that some of this cable was in conduit and we could not see it. I don't
400 think there were any defects there other than from the electrolysis, which I have already taken care of, but in case there was anything of that sort, we made this deduction of 1.32 and rounded out the figure to 95 per cent, which, in our judgment, seemed to be fair and reasonable. In that deduction we weighted the dead cable at zero per cent condition.

The last of my exhibits is A-38, which covers Accounts 251, Toll Poles Lines; 252, Toll Aerial Cable; 253, Toll Aerial Wire; 254, Toll Underground Conduit; 255, Toll Underground Cable; and Accounts 246 and 256, Exchange and Toll Submarine Cable. With the exception of the wire account and submarine cable, this exhibit deals with classes of property precisely similar to the pole lines, cable, and so forth, that I have already testified about, except that these are devoted to toll use instead of to exchange use.

401 Submarine cable is covered by pages 14 to 18 of this Exhibit (A-38). There is a very small amount of it, some 2,264 feet. Of course, that which we could inspect is the portion which ends in the manholes. We gave that the same allowance for depreciation as we gave underground cable, except that no allowance was made for salvage.

402 Toll aerial wire is shown on page 6 of this same exhibit. There is relatively a very small amount of that

wire. It was inspected at the same time the toll poles were inspected. Nothing wrong was found with it, but with the thought that there might be some wear, perhaps at the ties, which we could not see, we gave it a 1 per cent depreciation, to be conservative about it, and made it 99 per cent condition. There is $70,000 worth of that in the plant.

Conduits are protected largely by concrete. In heavy traffic streets they are completely encased in concrete. At other locations, where the traffic situation is not quite so severe, we sometimes use top and bottom construction. Of course, in the case of the lateral cables, small single duct, from a manhole to a pole, or in a parkway, sometimes we use plank protection,
and occasionally no protection at all. But corresponding
403 to the degree of protection required, it is ample to take
care of it. It is, as I said before, a very well constructed structure throughout. It is upon these facts that I stated a little earlier in my testimony that there is no depreciation in these classes of plant, at least in any ordinary circumstances, except that caused by accidental violence of some sort. I cannot see anything to depreciate about that kind of structure.

The amount of depreciation existing in these classes of plant covered by my inspection was determined for the year 1930. I have already testified concerning my familiarity with the plant throughout the period of years involved in this case, and to my knowledge of the Company's maintenance practices, by which defective parts are renewed and made as good as new in the regular course of maintenance; and also as to the Company's actual standards of maintenance throughout this period. On the basis of all these facts, I am able to testify as to the condition of these classes of plant for the years from 1923 on to the date of the inspection. It is my judgment that
the percentages shown in Exhibit A-22 are correct, and as
404 to the period subsequent to the inspection, the same thing
is true.

Plaintiff offered in evidence Plaintiff's Exhibits A-19 to A-35, both inclusive, and offered each of them separately.

Right to object to said exhibits was reserved by defendants until the close of the cross-examination.

406 ALBERT P. HYATT, a witness appearing on behalf of the plaintiff, having been previously duly sworn, resumed the stand and further testified as follows:

Cross-Examination by Mr. Haight.

The field men's work in connection with the inspection started, I think, in late January, and most of it was finished early in March. There may have been one or two further checks that we made later, but practically all of it was finished in March, 1931.

407 I have made a great many inspections from a maintenance viewpoint, to find how we were maintaining our property; that is what my job has been for many years. I had nothing to do with the inspection of 1923 to determine the per cent condition.

I have described three methods used in connection with the inspection. Method "A" was the gauging method; that is the method where we used certain gauges that we designed to measure the wear or depreciation, and so arranged that we could get approximate points between 100 per cent condition and zero; the particular type of equipment that we gauged was susceptible to wear and would wear out. The "B" method was a method by which we examined certain types of equipment very closely; examples are relays and keys, where we examined the condition of the springs and contacts,
408 and the bearings. That method was also followed in inspecting the power machines. We would examine the commutator and the brushes and the bearings. It was also followed in the case of batteries, where we examined the condition of the plates.

The "C" method was a method by which we inspected equipment, and based our results to a great extent on our judgment, gained from experience in maintaining that equipment and knowing what the general depreciation and wear and tear on it was. It was somewhat similar to the "B" method, but did not involve quite as extensive examination of the things, that is, they were more open to inspection in a broad

way of looking at it. That is based on judgment. You can tell in a very reasonable and, I think, in a very clear way, just about what the general deterioration or depreciation is on that equipment.

These three methods, I think, would cover the ones used in determining the per cent condition of the property con-
409 cerning which I have testified. There might have been a combination of those, but I graded them by those three general methods.

I gave the men under me instructions before this work was undertaken. The first instructions were in writing, but I supplemented those by personal instructions, that is, the written instructions were a broad guide, but in the personal instructions we discussed the various things we would run up against and looked for those. For broad guidance I had written instructions given out respecting Account 221, Central Office Telephone Equipment, but not for Account 222, Other
410 Central Office Equipment, because I inspected that personally. In each of the groups of field men, I had a supervisor to watch closely everything. He, of course, was in personal charge of the work all the time and kept checking it, so he may have given instructions, carried out from mine, but I gave the oral instructions in every case.

There were special written instructions given in regard to the manner of inspecting manual central office telephone equipment. These instructions were broken down into an outline of what we wanted to accomplish for each of those 14 component parts. There was a definite instruction for each one. I haven't these instructions with me, but will procure them.

411 I had specific written instructions for the inspection of dial central office telephone equipment and for the inspection of station apparatus. I had written instructions for the inspection of aerial wire, which is included in the one instruction for all of that equipment. I think those are all the written instructions for the inspection of any items of telephone plant, the inspection of which was under my charge.

The forms that appear in Plaintiff's Exhibit A-31 are the

forms that were used by the inspectors, following the methods of inspection A, B, C, or some of them, or combinations of them, as I have explained them. These forms were re-
412 ferred to in the instructions. The instructions always carried the same form number. Using the forms shown in Plaintiff's Exhibit A-31, and following the methods I have described, the inspectors obtained the information called for by the forms, when appropriate, of course.

Exhibit A-32 contains the summaries of all of the inspections, and that information so summarized in A-32 appears in Plaintiff's Exhibit A-22, in the last column, under the year 1930, as percentages of the complete account, but not of any sub-accounts.

413 When in the course of my examination on direct, I said: "We had a very clear understanding of what we meant by good, fair and poor. 'Good' was equipment that we considered just as good as new physically. 'Fair' meant there was some little thing off, some deterioration or depreciation that we considered was not in the third class and certainly was not in the first class, so we put it in the middle class. The last class we classified as 'poor'."

I had in mind at that particular time that the words "deterioration" and "depreciation" were synonymous.

414 When, in speaking of the gauges used to measure the wear in regard to some classes of equipment, I gave the illustrations of plugs and of cords, and there, in connection with that, used "depreciation," I did so in the sense of wear. Again, when speaking of that same item of property, I referred to the amount of wear or depreciation, and said that the greatest amount of depreciation would be 20 per cent, I meant that I was trying to determine the difference between the thing in the actual physical condition in which I found it, and compare that with the same thing if it were in 100 per cent or perfect condition. Wherever I speak of that difference and use the term "depreciation," I think it is that
415 physical difference based upon this inspection that I am talking about; I think I have tried to be consistent in that.

Q. And so, I find in some of counsel's questions to you, and in some of your answers, that same term "depreciation" used in speaking of this condition that you find, and I am safe in assuming, am I not, that in all of those instances you simply mean the difference between that thing, whatever it may be, in its condition of perfection, or, 100 per cent, and the physical condition that you then found it in?

A. I think that is right, if I understand you correctly.

I prepared a summary work sheet showing the per cent condition assigned to the central office equipment in each of the manual central offices. I prepared work sheets showing the per cent condition for each of the 14 component parts constituting each central office, for each of the following offices: Calumet, Canal, Dearborn, Delaware, Merrimac, Monroe, Newcastle and Tandem.

417 I now have my work sheets and the reports on the Dearborn manual office. It is divided into 14 component parts, as explained in my direct. The date of the inspection of the first component part, "A" and "B" section frames, is January 23, 1931. The second one, keys, is dated February 21, 1931. The third one, cords, is dated January 23, 1931. The fourth one, plugs, is dated January 23, 1931. The next one, jacks, is dated January 23. The next one, relays, is dated February 21, 1931. The next one, which is the four
418 groups: message registers, condensers, repeating coils, and resistances, is dated January 23, 1931. The next one, number 8, is dated January 23, 1931, and it has three groups of cables, local position cables, short multiple cables and all other cables. Number 9 is dated January 23, 1931, and has three component parts: frames, racks, and fuse boards. Number 10 is dated January 23, and covers the jumpers, terminals and protectors. Number 11 is dated January 23, and covers the test and repair desk. Number 12 is dated January 26, and covers the storage batteries. Number 13 is dated January 26, and covers the power machines. Number 14 is dated January 26, and covers the power boards, and the wiring.

That first component part, number 1, I inspected personally. The men did not have anything to do with that.

419 Number 11 component part I also inspected personally. The men did not handle that in the manual central offices. I think all of the other component parts were assigned to different field men that I had on the job. Mr. Redmund was present from time to time at some of these inspections; I think he went with me to eleven of the thirty or thirty-one manual offices. I don't think he visited Dearborn. Dearborn happens to be the first office we inspected and I made some tests on that two or three times. I think that is one of the reasons that the dates vary in there. On most of the exhibits you will find the dates, with the exceptions of the batteries and the power machines, which are very close together.

420 A portion of the Dearborn office is still in service. Speaking of it generally, I think it went out of service in March or April, 1931, as I remember.

Item 5, jacks, is right here (indicating). On one of the sheets, being sheet 3, in reference to the Dearborn office, name of inspectors, C. F. Esmiol and F. Wolfertz, there is a notation "pegs in sacks not removed for test." This page refers to outgoing multiple jacks. We peg jacks that are not in service in a group of trunks to another office. This refers to the fact that they did not remove those pegs. That was one of the instructions I had given: to be very careful not to remove any pegs, because it is a very important thing to get those back right. It affects service. In our inspection, we did everything to avoid affecting our service. That had nothing to do with the number inspected. The number in-

421 spected is shown in the column there. These pegged jacks weren't in service in relation to the whole group, but the whole group of trunks was in service. We have to have a margin of operation, so there are certain jacks that are not in use at a given time. They keep shifting the groups of them. I can't give the exact date of the original installation of central office equipment of the Dearborn office. I think that was about eight years before it was converted to dial.

Mr. Bracelen: If you wish, the record may show that the cut-over took place on January 31, 1931.

Mr. Haight: All right, thanks.

422 "The office was cut over" means that the lines that were formerly working in the Dearborn manual office were changed over to the new office. As I said, there was an exception of certain lines that are still retained on the old Dearborn board. In the main, the old manual equipment is discontinued when the other equipment is cut in. Ordinarily that would be true, but in the Dearborn office there was a little exception because a certain portion was retained.

In arriving at the conclusion that the accounts I inspected as appearing in Exhibit A-22 were correct for the various years preceding 1930, we had in mind, of course, that this, if we can call it such, is a projection backward. That is, we had our inspection results as of December, 1930. Of course, we started from that as a base. So we projected that back-

423 ward, taking into consideration any changes that had been made in that period between 1923 and 1930 that we thought should make a change in that inspection as we found it early in 1931. I would have no opinion as to definite percentages of condition during each of the years 1923 to 1929, both inclusive, without having made any inspection at all. I did rely upon the inspection made in 1931 because of the definite inspection for that year in projecting it backward into the other years. During each of those years, there was some difference in the size of the plant in some of these accounts, and during each of those years, going backward, there were differences in the relative proportions of old and new plant in some of the accounts. The relative proportions of panel and manual switchboards had not changed a great deal

424 in the various years. There was some little difference, but we did not find it would make much difference in the percentage. I know that because I know what went into the plant each of those years. There was displaced equipment and new equipment taking its place.

I don't think I can say offhand how much of the plant that I inspected during 1930 was in existence in 1923; I don't

believe I would want to say without thinking it over a little. That would have some bearing. I had a very clear idea of that when I worked it out, but I would have to go back and think it over. This does not appear in any of my working papers in which I worked it out, but it is one of the things

Mr. Redmund and I discussed a great deal in connection
425 with projecting these percentages back. We were asked to try to arrive at the per cent condition in these different years, and we definitely stated we had no inspections for those years. So we made an attempt to project that backward, and I think from my judgment of the plant during those years, that that is pretty close. It may vary a fraction of one per cent in different years. Take the booths, for example: there was a radical change in the types of booths and the quantity that came in in that period, and we allowed for that. Just toward the end, we got quite an influx of dial equipment and the new toll board for handling long lines that went in early in 1929 or late in 1928. So we made a change there, in central office. That is the only change that we could see ought to be made. Save for that and booths and P. B. X.'s (there was quite a change in type of P. B. X.'s during this period), I assumed the same rate of increase, the same rate of retirement, and the same rate of everything from year to year throughout.

426 I have no working papers that I used in determining the per cent condition, or figuring out the per cent condition for any years other than 1930; that is, for 1923 to 1929, inclusive, and for 1931. There isn't a scrap.

These matters to which I refer by way of defects, generally speaking, are matters of maintenance. That is, most of these items we would usually clear up in our regular maintenance work, but a great many of the particular items that I called

defects or depreciations are things that, while in my
427 judgment they detracted from the perfect condition or 100 per cent condition, we ordinarily would not spend good money to make as good as 100 per cent; for example, switchboard cables. I took off something for the appearance of the cables, the fading; we would not spend money to put the

cable back just to make it look prettier. So in all of those things I have taken depreciation off of what I considered brand new.

There is practically no wear in the principal part of the power machines in central office equipment. When there is wear in the course of time on the brushes, we put in new brushes. That is an ordinary matter of maintenance. All of those items are charged to maintenance, and that is true as to most of the items to which I have testified. Save for
428 that general exception I have just mentioned, I think that is true.

I did not testify to any inspection made in 1927.

I found no inadequacy in the inspection of the property I had charge of. From what I know of the plant, if I were inspecting the property in 1924, I don't think I would have found any inadequacy. There might have been some. I
429 could not say, but I doubt if there was. I mean by inadequacy, in the way I look at this, that the equipment was not adequate to operate. Take, for example, a battery. Now, when that battery is put in for the ultimate of that particular office, we don't put in a full supply of plates, but as the lines increase, and we get to the point where we need more plates, we can readily add them. Now, if I found that they could not add additional plates, and found that they had to tear out the whole battery to take care of a normal addition, I would probably call that inadequate. I did not find anything of that kind in any part of our equipment. It was adequate to take care of everything.

Of course, there is a margin on all these things, just as I described in this battery tank, there is a margin that is
430 available. I would not go so far as to say that there was no part that was not actually working. We have a margin of everything, just like I described those jacks that were pegged out. That is a margin. You have to have a margin on all equipment to operate. I should not think generally that a central office switchboard ever becomes inadequate. I should not think so, generally speaking. I think we always have means to enlarge or extend that board by putting on additions

to the building, or going up in the air, or rearranging the boards. In my experience I have rearranged a lot of boards so we could add sections. Originally, we used to install boards that would finally grow up to the end of the building. It might not be economical to add to that building, so we would shift the board around so we could grow; we would just keep extending and building on. When we come to a situation where the switchboard is not sufficient to care for the service that we wish to give through that particular office, and we add on in the manner I described, I would not call that neces-

431 sity inadequacy of that equipment. All I mean when I say I can translate my mind back to 1924 and give a per cent condition, and that I remember whether there was any inadequacy or not at that time, I simply mean that in my judgment, what did work then, worked, and there was a margin for growth. When I translated or projected the result of my inspection in per cent condition from 1930 back to the preceding years, as, for instance, 1925, it was based upon my general knowledge of the plant and growth during those years and the changes; I have been very closely connected with them. It was not based upon any calculations, but just upon general judgment.

432 I have no substantiating data in respect to those years. It might have happened for a very short time between 1923 and 1931 that equipment was being used so completely and fully as to have no margin for growth, so as to be inadequate in that sense. I know in my own experience that we have had cases happen for a short period, if our growth was faster than our engineering plans permitted the equipment to get in, but usually the margin in planning ahead was such that we were always ahead of the growth.

433 *Re-direct Examination by Mr. Bracelen.*

The Dearborn office, which the record shows was cut over January 31, 1931, was a manual central office cut over to dial at that time. There were about 30 or 31 central offices in the Chicago plant of the Company at the time of my inspection, including the Tandem. Eliminating the Tandem,

that has since been changed to dial, the Delaware that has gone to dial, and most of this Dearborn that has gone to dial, there would be three less, so that there are in the plant today 28 manual central offices, substantially like the Dearborn office. I don't have any exact idea of the number of telephone subscribers or telephones being served today in Chicago by manual offices, as compared with the number of dial offices or
434 subscribers, it is somewhere around 20 per cent dial, as I remember, and 80 per cent manual. That may vary three or four or five per cent.

The plant that is covered by the per cent condition shown on Exhibit A-22 for each of the years involved in this case is the plant, and all of the plant, and only the plant which was being used by the Illinois Bell Telephone Company for giving service that it has given in the City of Chicago throughout that period of time.

435 *Re-cross Examination by Mr. Haight.*

I only had three or four reports concerning the Dearborn office in February. I can explain those, if you wish me to. Two of the items were inspected in February. I finished my inspection some time in February. The board was still there at that time, though. I will be glad to explain that more fully.

B. T. YOUNG, a witness appearing on behalf of the plaintiff, having been previously duly sworn, resumed the stand and testified further, as follows:

Cross-Examination by Mr. Haight.

I had nothing to do with determining the per cent condition of any of the property of the Illinois Bell Telephone
436 Company in Chicago in 1923 or 1922.

Not more than four of the buildings are new since 1923. Roughly, seventeen of the buildings have had additions made to them since that date; I am not just sure of the exact dates of some of them, away back in the period.

I used the figures from Mr. Renwick's appraisal in determining the percentage of the value of each building to the entire building property. I understood Mr. Renwick's estimate to be the cost to reproduce these buildings new.

437 I made no specific use of sub-contractors' contracts, which I said followed very closely the component parts of the buildings, enabling me to determine accurately, for instance, the average cost of electric wiring. We have had at various times, as a matter of interest, breakdowns. We do not normally get the amounts of these sub-contracts. Back a number of years we have had, for our own information, a so-called breakdown of some total general contracts, which gave us what we considered a very close idea of the costs of the various parts. That is not an idea peculiar to myself, that is, similar information is always available in engineers' and architects' handbooks. I did not use any definite sub-

438 contractor's figures in any manner in arriving at my judgments. We had made up, as I said, just as a matter of information, some several years ago—I made it myself—a study of that kind, to determine rather accurately the value, for instance, of electric wiring, and heating systems, and so on. I based this work on that previous study, making such variations as were necessary, depending upon the type of construction.

I gathered all of the information that is contained in Plaintiff's Exhibit A-33 myself.

NOTE: In the following, the page relating to the Austin Building was used for the purpose of illustration.

The notations under "Reason for Deduction" were what I noted to serve as a guide. That is, it gave me a very good picture of the condition of, for instance, the exterior ornamentation. They are not the sole reasons for the deductions made.

Referring to the item of glazing, showing 17 lights

439 cracked: it is not necessary at all to replace the cracked lights, unless they constitute a dangerous condition, which none of these could, because they are practically all of wire glass. They might remain cracked for years without any

necessity for replacing them. If they had been badly cracked, they would have been replaced as soon as damaged. If they had reached a point where it was advisable to replace them, they would have been replaced, because that would only have been so if a dangerous condition obtained. That replacement would be charged to maintenance. The wood sash are reputtied periodically if required, and charged to maintenance.

440 What would be done with the damaged pipe covering, noted for "Heating and Ventilating," depends on the degree of the damage. Ordinarily, if the canvas of the covering cracks slightly, nothing is done about it. If it reaches a point where it is hanging in shreds, it is replaced. The minor cracks probably are not visible to the layman at all; they would never be noticed.

My notation as to lighting fixtures is "that all fixtures require refinishing." If that were done, it would be charged to maintenance. Most of these items that appear here listed under "Reason for Deduction," in connection with the Austin Building, and for that matter, all of these other buildings, are items that relate to conditions that are rectified and charged to maintenance, as a rule.

441 As an illustration of the things taken into consideration for deduction from condition in addition to the things that are listed on these various sheets in Plaintiff's Exhibit A-33, as "Reason for Deduction," I will take, for example, interior marble. There is, in that building, a considerable amount of marble in the floors, toilet stalls, wainscoting, and so forth. Well, I actually only found four stair treads worn, and one threshold cracked. That gave me what I thought was a fair picture of the condition of all of the marble. That is, there might have been, at the joints, some very minor chipped places, or the joint might have needed a little repointing, but they were things really too small to note. But in going over all the marble in the building, I noted these points as a sort of memorandum to give me an idea what the

442 whole picture was. When I refer to other things, I simply mean that in looking at the others at the particular time

I did look at them, I made these notations as to the important items, but there were other things that influenced my judgment as to the then physical condition, of which my explanation of the marble is a fair illustration. These are the important things noted here, however. The others were infinitesimal. That is true throughout this exhibit in reference to the other buildings.

I had nothing to do with that 1923 figure in Exhibit A-22. For the years 1924 to 1929, both inclusive, and for 1931, in supplying this figure, I gave it as my opinion that a
443 straight line curve projected backwards would reflect the condition of the buildings during that period. I took into consideration the fact that there had been some new buildings built during that period, at least four. That would not alter the trend of my curve during that time. While one might consider that they would increase the per cent condition at the time they were added, yet on the other hand there is a certain falling off (probably on some of the older buildings) that we decided would offset that. A great many more old buildings would not necessarily send the curve the other way, because during that period some of those new buildings were of considerably greater size and value than the older ones.

The largest building is a 20-story building, built, I think, in the summer and fall of 1912, just before I came with
444 the Company. The next largest building is an 18-story one. The first 11 stories of that building were erected, I think, in 1919. There was an addition of 7 stories some time during the last two or three years.

The per cent condition of the entire group of buildings for the year 1923 should be about the same per cent condition as of that same group of buildings, with their additions and new buildings, in 1927, let us say. Based on the maintenance standard, and considering the group at all times as a whole, it
445 would be about the same. My opinion is that it is about the same. I have an opinion as to 1923. Throughout my experience with buildings during that period, while I had nothing to do with any inspection for a rate case, I have been

in all of these buildings practically every year. I have not such an accurate opinion as to 1915, because that was a number of years ago. Of course it is a little hard to recall things that far back, and at that time I was not as active in the field. I did not have the responsibility that I have at this time. I became more active in the field after the war, in 1919; of course, it has been increasing constantly since then. My
446 inability to go back to 1912 or 1913 is because that during the period that has since elapsed I have made no attempt, of course, to keep that in mind.

I cannot give an opinion as to the per cent condition of the buildings that will be in existence in 1937. I could guess at it, but there is nothing to base it on. There is no foundation to base it on at all. It would be purely a guess. I would guess it probably would be in the nineties. Before venturing an opinion on a subject like that, I would not necessarily want the facts in each year, because the condition does not change except over a period of years.

It took, I think, from seven to ten months to put the
447 addition to the 18-story building to which I referred (the Franklin Office Building). That would be an important factor during that year.

If I were to tell the per cent condition of buildings from now forward to 1937, it would be only a guess.

I would not be much better contented if I had analyzed
448 each of these years 1929, 1928. When talking of the future, I have not seen, and I do not know what kind of buildings those might be, but when talking of the past and present I do know what these buildings are, and I have been in them during each one of these years; inspected certain parts of them and the condition is bound to change on a well-constructed building very little from year to year, especially considering the standard of maintenance we have. I am able to say that they are in approximately the same condition for each of those years. I don't know what the figure given in 1923 was, but, based on this, the natural method of procedure would be to project a straight line curve, and I think it is reasonable.

I didn't know what the figure for 1923 was. The figure for 1930 is the only one I had anything to do with. I didn't
449 project it back to 1923. I was asked my opinion if that figure would hold good, that is, if that was a fair method of arriving at a figure for each year. I could project the 1930 figure back to 1919, for instance, just 93 per cent for each year. There is no reason to suppose there would be any difference for 1918; or 1917 would be right, also, in my opinion. That would be all right for a period of course not too far in the past. On this same group of buildings the same figure would be all right. The same would be true of 1914 and
450 1913. I would not be qualified to say whether the same holds good prior to 1912. I would have to stop at 1912, as I know nothing about them before that time. When I said a moment ago, "Of these same buildings now in existence," I did not understand that we were postulating, that we were carrying the buildings themselves back.

In one of the answers that I gave yesterday, I spoke about depreciation found. I meant the difference between those
451 buildings in the condition I found them in, and those same buildings if they were in perfect or 100 per cent condition.

I did not have any written instructions, nor use any written instructions in respect to finding the per cent condition of these buildings. Mr. Redmund outlined what he wanted, and left it more or less to me to formulate a plan of procedure, which I outlined to him orally before I started. I have made no working papers, and have had no working papers, nor have I anything written in respect to the projection of my opinion of 1930 back into 1924 and intervening years. There is no such thing in existence and never has been.

452 On each page after the first or the summary sheet in Plaintiff's Exhibit A-33 is a legend, of which the one on the first page relating to the Austin Building is a fair illustration (the figures are different in the others), as follows: "As the reconstruction cost of this building represents 1.583 per cent of the total reconstruction cost of the entire group,

and its present condition is 5.739 per cent less than originally, the effect will be a .091 per cent deduction from the condition of the building group as a whole." The words "than
453 originally" in that legend mean new at the time of inspection.

MAYNARD H. RILEY, a witness on behalf of the plaintiff, having been previously duly sworn, resumed the stand and testified further as follows:

Cross-Examination by Mr. Haight.

At one point in my testimony, in speaking of the pole lines account (241) appearing in Plaintiff's Exhibit A-34, I said for the last ten years the poles have been butt treated. That
454 was true in 1923. This butt treating started about 1920 or 1921, as I recall it. There were many poles in about 1920 that were not butt treated. The percentage or proportion of those that were butt treated would increase rapidly, beginning at that time, because all new poles at that time were butt treated.

I had a number of men who assisted in this work under my direction or charge. In part of this work, I took part personally, and in respect to all of it, I supervised it. Those men were given instructions in writing prior to the time that the work was undertaken. I had specific instructions for the inspection of main underground cable. I had specific instruc-
tions for all of the accounts, in so far as they related to
455 the use of the forms, and the character of the inspection.

There were specific instructions for Account 241, for Account 242, and for Account 244, but not for 251; the same instructions applied to that as for 241. Similarly, for toll (Account 252) there were no written instructions, as I recall, nor for Account 253, aerial wire, toll aerial wire. For Account 254, the same instructions would apply as for 244; similarly for 255. There were no instructions written for Accounts 246 and 245, covering a small amount of submarine cable.
456 I have copies of those instructions with me. I will produce copies that can be put in evidence.

In Account 241, we were undertaking to find out the per cent condition of the poles. That also applies to Account 251. By per cent condition in respect to poles, I mean the relation of condition between those poles in 100 per cent, or perfect condition. On the rest of the accounts, we were undertaking to find out all of the facts that we could find out from this inspection upon which we could base our conclusions as to their per cent condition.

457 Plaintiff's Exhibit A-35 is the one relating to aerial cable. For sheath defects there was a 2 per cent deduction. The extra sleeves were taken into account. There is some question as to what effect an extra sleeve may have on the condition of the cable. It is a case where there may have been a case of trouble, and the extra sleeve is evidence of the fact that it has been repaired and taken care of, or it may be due, for instance, to a pole having been moved, and the terminal location moved, causing that particular point to have to be closed up, and a sleeve put over it. If there is a satisfactory job done, that cable sheath is just as good as new where that extra sleeve is, but there is a possibility that a little faulty workmanship may have been done, so I think we should make some allowance for those cases. The cost of repairing a defective or injured cable sheath is charged to maintenance.

460 On sheet 1 of Exhibit A-35 there are listed at the tops of the vertical columns, certain items, beginning with terminal, span, and continuing with sheath which was injured, kinked or cracked, and so forth. These are the defects we are accustomed to encountering in our maintenance work, and are the kind of defects that, when they occur, are usually charged to maintenance. This is not altogether true of all the exhibits which have been produced by me, from this
461 one on up to and including Exhibit A-38. For instance, in the terminals, some of those major defects would possibly result in the replacement of the terminal. It would be replacement rather than maintenance. As to defective pairs

in cables, if made good, the cost would be charged to
462 maintenance. The poles would be charged to replace-
ments. Other than those exceptions, I think that it is gen-
erally true, so far as the items listed are concerned, that the
defects are charged to maintenance.

In the third vertical column on page 4 of Exhibit A-35, headed "Per cent depreciation," there are three sub-columns one headed "Allowance for defects found by inspection"; the next, "Other allowances"; and the next one, "Total." In that first one of these columns, headed "Allowance for defects found by inspection," is found "2 per cent"; those are the allowances for defects of that character that we find listed, or at least some of those, upon the form on page 1 of
this exhibit. In the next column "Other allowances," the
463 "2.77 per cent" relates only to defective pairs in cables.
The information respecting that, I obtained from records in the office relating to cables, where the fact that they were defective was determined in operation. There are then added together the 2 per cent and the 2.77 per cent, getting the 4.77 per cent appearing in the next column. I then say in the next column that cable will have a salvage value of at least 18 per cent, so I say, "We will put in that column the difference between 18 per cent and 100 per cent, or 82 per cent. Then we will apply the figure 4.77 to that." Thereupon, we get in
the next column 3.91. Then we subtract the 3.91 from
464 100, and in the next column we get the per cent condi-
tion, or 96.09. That is the process. If, instead of subtracting 3.91, I subtracted the 4.77 from 100 per cent, obviously the per cent condition in that particular instance would be 95.23. So by that system of mathematics I increase the per cent condition in relation to the 100 per cent condition. The final per cent condition that I give in that column, of 96.09, represents, in my judgment, the per cent condition of the cable in relation to cable new at the time of inspection. That is, if it were 3.91 per cent better, it would be a perfect cable as it then stands. That same thing applies throughout these
exhibits, where we have calculated using net salvage as
465 it appears on this page. When I use the word "depreci-
ation", it simply means that I am using that term to

measure the difference between a thing that is perfect or in 100 per cent condition, and the actual physical condition that I find it in, which may be 4 per cent less or 10 per cent less, as the case may be, in these various exhibits.

467 ALLEN G. HOYT, called as a witness on behalf of the plaintiff, having been first duly sworn, testified as follows:

Direct Examination by Mr. Blackman.

My name is Allen G. Hoyt. I reside in New York City. I am Vice President of the National City Bank of New York; and also of the City Bank-Farmers Trust Company. I have been Vice President of the City Bank-Farmers Trust Company since 1929, and of the City Bank since 1928. Prior to that I was Vice President of the National City Company, which is a corporation affiliated with the National City Bank.

468 The National City Company, while I was connected with it, was engaged in the underwriting and distributing of investment securities, stocks and bonds. It dealt in public utility securities. The financing of public utilities which the National City Company undertook for its sole account, or in which it participated with others, aggregated, during the period that I was Vice President, many hundreds of millions of dollars. I was Vice President from about the year 1918 to 1928. During that period, the National City Company participated in a great many underwriting syndicates of securities of public utilities. It engaged in the financing of companies other than public utilities, and in the underwriting of their securities.

469 I was connected with the National City Company prior to the time I became Vice President for two years, 1916 to 1918, and was in the banking or security business prior to my connection with the National City Company. In 1907 I became a member of the firm of N. W. Halsey & Company. N. W. Halsey & Company of New York were investment bankers. They were engaged particularly in the financing of

public utilities. They also handled securities of railroads and industrial corporations. I was connected with this Company from 1907 until 1916. Their principal office was in New York; and they had offices in other cities in the country, including Chicago and San Francisco.

I am and have been a director of a number of public utilities. At the present time, I am a director of the International Telephone & Telegraph Corporation, and the New York
Steam Corporation, both public utilities. In the course
470 of my experience, I have had occasion to come into contact with the question of borrowing funds for corporations, both on the side of lender and on the side of borrower.

During the time I was Vice President of the National City Company, it participated in financing a considerable number of telephone issues. It participated in all of the bond syndicates formed to handle the bonds of the American Telephone & Telegraph Company. It participated in the bond issues of a number of affiliated companies of the A. T. & T. System, including the New York Telephone Company, the New England Telephone Company, the Northwestern Telephone Company, the Illinois Bell Telephone Company, the South-
471 western Bell Telephone Company, and some others. At the syndicate meetings, I usually represented the National City Company in connection with the negotiation of the issues.

During the years when I was actively engaged in financing public service and other companies, if a public utility or other company operating in any part of the country wished to raise funds through a bond issue of a substantial amount, say, in tens of millions, it customarily went to New York City in order to get that money. I think there were very few issues of the size of ten millions of dollars where the principal underwriting was not undertaken in New York City.

I have continued to follow the matter of corporate security issues since the change in my duties. I am at present one of the officers having charge of the investment of trust funds
472 and review of investments, and my present duties necessitate my continuing to be familiar in a general way with the financing and development of public utilities. New York

has continued to be the most important market for the financing of the kind referred to. That applies to stocks as well as bonds. Generally speaking, I think the prices for money in New York are lower than elsewhere.

In the course of my business and in making loans to the American Telephone & Telegraph Company and its various subsidiaries, I have become familiar in a general way with that Company. The American Telephone & Telegraph Company is primarily engaged, either directly or through
473 its subsidiaries, in the telephone business. In the Bell System, as it is commonly called, there are about 16,000,000 telephones. The A. T. & T. Company, at the end of 1930, in the last balance sheet I have seen, showed on a consolidated basis, assets of about five billions of dollars; and its net earnings for the year 1930 were about $270,000,000. Its capitalization, at the end of 1930, on a consolidated basis, was as follows: it had outstanding stock to the amount of $2,155,000,000. The outstanding bonds of the Company, and of the system, amounted to approximately $1,115,000,000.

In addition to its telephone business, the Company is engaged in various other activities. Through the Western Electric, it has a very important manufacturing business, where telephone equipment is manufactured. The sales of the Western Electric I think last year were over four hundred millions of dollars. The Company is also engaged and has taken a very prominent part in the development of the talking moving picture. Many moving picture houses in the
474 country are equipped with the A. T. & T. system of reproducing sound. The Company also takes a very important part in the development of phonograph records and reproduction. The Company does a large business of a telegraphic nature. By that I mean many of its circuits or lines are leased to the Western Union and to the Postal Telegraph Companies.

In addition to that, it furnishes leased lines for telegraphic business between principal offices. It has the process of transmitting typewritten undertakings by wire. It also is importantly engaged in the radio business. From certain

studios, over the wires of the A. T. & T., programs are broadcast through many chains of broadcasting stations. The Company has also been in the forefront among the developers and experimenters in television.

These outside activities I think have appealed to the imagination of the stock buyer, perhaps more than the
475 utility departments of the business, and have accounted to a considerable degree for the fact that its stock at times has sold at very high prices. That condition obtained *to a marked degree* particularly in 1928 and 1929, and partially in 1930. I think it sold proportionately higher than the prices of other stocks. U. S. Steel is no exception to this because it was making very large earnings during this period. It is impossible to generalize about whether the slump of A. T. & T. stock was just about the same as other first class stocks, because the depreciation has not been uniform.
476 What I was referring to particularly was a comparison with utility stocks.

This outside business, which was non-utility and non-regulated, affected the price of the Company's stock and its ability to get money.

I know the Illinois Bell Telephone Company in a general way. Some years ago, we participated in the syndicate which handled its bonds. During the period from 1923
477 to 1931, the assets of the Illinois Bell Telephone Company have grown from about $171,000,000 to $322,000,000. Its capitalization has grown from about $117,000,000 or $118,000,000 to $200,000,000, approximately. I understand that about two-thirds of the investment of the Company is in the City of Chicago and that has had a similar growth over that period.

In the course of my business, I have become familiar with the way in which the investing public regarded and regards the various classes of securities in which my Company has dealt during my connection with it. I have become
478 familiar with the risks and uncertainties which such investing public considered and considers attend the various enterprises which have issued such securities. I have

become familiar with the returns that were and are being made by the various enterprises on the securities in
479 which my Company has dealt. I am familiar with the returns which are being made generally in this part of the country on investments in public utility and other businesses and, in a general way, with the prices at which the securities of such companies sell and were sold.

I refer to both the wholesale price and the retail price. In connection with the distribution of bonds, the securities are usually sold by the corporation at wholesale to a banker or a group of bankers. That price is below the price at which the bankers reoffer the securities to the investing public, the difference being the margin to the bankers to cover the cost of distribution, profit, and so forth. The cost of money to the corporation is the wholesale price, except that in connection with the issues, the corporation has further expenses to meet, which somewhat increases the net cost of money
480 above the yield at the wholesale price. I refer to the cost of printing the bonds, trustees' fees, attorneys'' fees, expense of listing, and so forth.

After bonds come into circulation, they have a certain market price. That market price does not indicate the price at which a large block of bonds, or a new issue of similar bonds, could be sold by the Company. The stocks sell on the Exchanges at a certain price. That does not indicate to a banker, however, that the Company could make a large new issue of stock and obtain the price at which the few shares traded in per day bring in the market.

The American Telephone & Telegraph Company, in selling its securities, comes in competition with all other borrowers so far as bonds are concerned. It comes in competition with all other seekers of capital by stock issues as far as its
481 stocks are concerned. In the future, if it undertakes to get additional funds, it will have to compete with others. The Illinois Bell, were it to finance, would have to enter into competition with other borrowers or other seekers after capital. The American Telephone & Telegraph Company competes for funds most directly, I think, with other public utility

corporations; particularly the gas and electric companies. The particular corporations with which the Illinois Bell would come into competition in marketing its bonds or stocks to the public are gas and electric companies.

In the course of my business, I have become familiar with the risks and uncertainties which attend an investment in a telephone business in the eyes of those investing therein.
482 Some of those are: the Telephone Company is strictly limited, as far as its profits are concerned, by reason of regulation; as far as losses are concerned, however, the Company is unlimited. If it cannot find the business for itself, of course, it must take a loss. On the other hand, if the business develops very successfully and it earns more than a reasonable return, it will be compelled to reduce its rates.

There is a hazard for the Company by reason of the fact that if, at any time, on account of increased operating expenses, or for other causes, the return becomes inadequate, the procedure of obtaining relief is usually long drawn out. The question of taking the proofs to the Commission usually in the first instance, and the frequent necessity of appeal from the Commission to the courts, may require a number of years before the Company can obtain relief and receive permission to charge adequate rates. Furthermore, during this period of inadequate rates, the Company suffers a certain loss or deficiency in return. That loss is gone forever. It is permanent, because the regulatory bodies or the courts in afterwards readjusting the rates do not make allowances
483 which will permit the Company to make up a loss incurred during the period of inadequate rates. On the other hand, should the earnings of the Company show more than an adequate return, the Commission or public authorities are very likely to move very promptly for a downward revision of rates.

I have not seen a survey, taking into account all the cases, which shows in what percentage of rate cases the companies have been able to get any relief from the State Commis-
484 sions in the first instance, without going to the courts.

But I have come in contact personally with quite a number of important cases. In all of those cases, I think the companies had to appeal to the courts to get an increase.

A telephone company makes an unfavorable comparison with respect to other public utilities, particularly an electric or a gas company utility, in certain respects. I refer to the fact that the principles of mass production are not, in my opinion, applicable to a telephone company. As a matter of fact, as the telephone company's business develops, the investment per station tends to increase, and in view of the fact
that the investment tends to increase, the return upon
485 that additional investment is constant. On the other hand, the electric and to some extent gas companies, as their business develops, are enabled to install larger and more efficient generators, and the tendency is for the cost per unit of output for those companies to decline.

Furthermore, I think that the telephone company is at somewhat of a disadvantage by reason of the fact that in the event of declining business, the electric and gas companies may reduce their purchases of fuel, and fuel is an important item in production cost. A telephone company, however, providing only service, is not in a position to show the same flexibility of operation and reduce production cost to the same extent that the other public utilities are.

There have been the following developments that affect the outlook of the telephone company during recent years: the business has expanded very rapidly; and in that expansion the company has reached a clientele of more moderate means than the average subscriber, I believe, of a few years ago. That means, of course, that the company is in a more vulner-
able position than heretofore because, if these subscribers
486 of moderate means have reduced incomes by reason of part time employment or unemployment, or reduced salaries, they are very likely to terminate their telephone contract and have the instrument disconnected. I think the telephone company compares unfavorably with the gas and electric companies in that respect, because the electric companies supply many houses with illumination. A householder or apartment renter must use a certain amount of electricity,

if he has any illumination at all. The same thing is true, to a degree, of the gas company, because there are, in many instances, no other means available to the customer of the gas company for cooking except by using a certain amount of gas. On the other hand, the telephone subscriber can have his telephone taken out; and telephones are being taken out. It is the exeperience of telephone companies that they are losing at the present time a great many subscribers.

I think that in the minds of some investors also there is the fear, as far as a telephone investment is concerned, that the telephone company may be adversely affected by the
487 further development of wireless communication.

I think there is one further hazard in connection with the telephone business, and also to some degree other public utilities: the telephone companies and other public utilities have made very large investments during the past four or five years, and during a considerable part of that time, construction costs were high. It may be that construction costs will decline. As a matter of fact, they are showing a declining tendency. It may be that a reappraisal of the reproduction value of public utility property will show, as far as that part of the plant is concerned which was constructed during the past four or five years, that the duplication value is materially below the actual cost; and as duplication value is to be given great weight in determining a rate base, it may be that the rate base, as far as the property is concerned which was installed during the past four or five years, will be adversely affected. The investor in public utilities speculates on the price of labor, material and other things, just as an investor in any other business.

488 I think it would be fair to say that my last statements concerning the comparative difficulties of procuring capital by gas and electric companies on the one hand, as distinguished from telephone companies on the other hand, would apply specifically to the Illinois Bell.

489 The telephone business has shown great stability up to a certain point, the reason being in my opinion that until recently the telephone industry never approached the point

of saturation. There was always an unfilled demand for telephones up until recently. The gas and electric companies have enjoyed a similar experience. In fact, by reason of discoveries of new uses for electric companies particularly, and to some extent gas companies, they have perhaps enjoyed benefits which the telephone company does not enjoy, as, after all, a telephone plant can only be used for transmitting the spoken word.

In my opinion, a telephone company such as the Illinois Bell Telephone Company must earn, at the present time, a return of more than 8 per cent on the value of the property which it employs for the convenience of the public in
490 Chicago, in order that such return shall equal that generally being made at this time, in this part of the country, on investments in other business undertakings, which are attended by corresponding risks and uncertainties.

The money markets at the present time are very much disturbed. I am inclined to think that no operation running into hundreds of millions of dollars, whether by means of bonds or stocks, could be successfully underwritten at the present time. The demand for long-term investments, even of the highest character, is very much limited. The uncertainties regarding the Government's program, and the knowledge that the Federal Government must enter the market for enormous amounts within the relatively near future, make it further impossible for private corporations and even municipal and state corporations (states which have heretofore enjoyed the highest credit), to obtain funds in large amounts at the present time.

In my opinion a telephone company such as the American Telephone & Telegraph Company, doing a nation-wide business, must earn a return in excess of 8 per cent on the
491 value of the property which it employs for the convenience of the public, in order that such return shall equal that generally being made at this time, in this country, on investments in other business undertakings, which are attended by corresponding risks and uncertainties.

In answering questions as to what risks and uncertainties were in the mind of the investing public, I was considering the

risks inherent in the business, irrespective of the present market conditions. The risks that I referred to are recognized, I think, by bankers and others, who invest in securities of this kind.

The return which a telephone company such as the Illinois Bell would have had to earn on the value of the property which it employs for the convenience of the public during the period beginning with 1923 and continuing down through 1931, in order that such return would equal that generally being made at the time in this part of the country, on investments in other business enterprises which are attended by corresponding risks and uncertainties, would have been
492 as follows: I think the return in 1923 would have had to have been 8 per cent; in 1924, 8 per cent; in 1925, 8 per cent; in 1926, 8 per cent; in 1927, 8 per cent; in 1928, 7 per cent; in 1929, 7 per cent; in 1930, 7 per cent. In 1931 I think the situation changed, toward the latter part of the year, and the return during the latter part of the year would have had to have been increased to 8 per cent. In 1932, over 8 per cent; it is impossible to say at the moment how much over 8 per cent. I do not think you could assemble the capital to buy or build a public utility on any terms at the present time.

497 FRANK REDMUND, recalled as a witness on behalf of plaintiff, having been previously duly sworn, further testified as follows:

Cross-Examination by Mr. Haight.

I did not make an inspection of the Chicago property of the Illinois Bell Telephone Company in 1922 and 1923, and had nothing whatever to do with an inspection made at that time. I did not testify in relation to such an inspection upon the first hearing of this cause. The only inspection that I have had to do with is the one resulting in Plaintiff's Exhibit A-22.

498 In preparing this Exhibit A-22, I did not take into consideration the inspection that was made in 1922 and 1923. I knew that such an inspection had been made, but did

not take it into consideration in arriving at the condition of the property in 1923; I simply tried to arrive at what appeared to me to be the correct figure for December 31, 1923, by a consideration of the findings for 1930, and my general information and knowledge as to the relative condition of the plant in the preceding years. The information for the years 1923 to 1929 in Exhibit A-22 was based on the information gained through the inspection resulting in the figures for
499 the year 1930, taken together with my general knowledge of the relative condition of the plant in the preceding years.

I don't think I ever considered the question of whether I preferred to use, for the year 1923, the inspection made by me in 1930, or the inspection actually made in 1923. I was making this estimate myself with the assistance of the other men who have testified. I do not think it ever occurred to me to use something else. That idea was never suggested to me, or to anybody involved in the making of this determination of per cent condition.

It is hard to say in what connection I learned that an inspection was made in 1923. Of course, we know of a good many things that are going on, without having them brought up specifically for any purpose. Now, I know that an inspec-
500 tion was made. I know the man who made that inspection, but I cannot tell how I actually knew that inspection was made. Now, it is also a fact that I saw something of that inspection in the previous testimony in this case. I think I had some talk with the man who made the inspection, because I meet him quite frequently, but I cannot tell you specifically when and how the matter came to my attention.

I think the subject was referred to at various times by someone in my presence with relation to the making of
501 Plaintiff's Exhibit A-22. The only reason I worked 1923 back from 1930 was that I felt that this was a new job that I was responsible for myself, that I was doing myself, and I did not take into consideration what had been done before.

I knew that retirements were by no means uniform from

year to year in this plant. I took into consideration the general knowledge which I had of the relative condition of the plant in those preceding years. I did not, in making Exhibit A-22, postulate that retirements were substantially uni-
502 form. I knew that retirements were not uniform from year to year. I do not think I made any allowance for that, except in the three cases mentioned. In the case of booths and special fittings, I knew that there had been a rather unusual number of booths replaced during that period, and therefore I showed a lower percentage in the earlier years. Now, to that extent, we took that into consideration. I also explained the same situation in regard to private branch exchanges. I also explained why, in connection with central office equipment, I lifted the per cent from 92 in 1928, at which it had run from 1923, to 93 in 1929 and 1930. I knew that retirements were not uniform, but I do not think, except for those particular cases, that there has been a
503 sufficient change in the average and general character of the various parts of the plant, to have any material effect on the per cent condition. I do not mean by that that the retirements fluctuate over a rather narrow range. I do not think that there was enough difference in any of the other accounts to have affected the per cent condition materially. I know that retirements vary considerably, not merely for any one class of plant, but for all of the classes taken together. I took that into consideration, but I did not think, except in the accounts mentioned, that the resulting
504 change in per cent condition would be considerable. I considered simply my general opinion as to the relative condition of the plant in those previous years, compared to 1930.

By "condition of the plant", I mean per cent condition compared with the new plant. I took into consideration the wear and tear that existed at the time of the inspection. The obsolescence that I took into consideration was only the realized complete obsolescence that had removed the possibility of the particular item giving further service. Of that, I gave

four instances. I did not find anything which I consid-
505 ered inadequate. I bore in mind the question of ade-
quacy or inadequacy in coming to the conclusions as expressed in Plaintiff's Exhibit A-22. I considered, from my general knowledge of the plant, that for each of those years there could have been no inadequacy.

The situation is that you are always making certain additions to plant in some places, and you have certain spare plant in other places. That is the general condition which has existed throughout the period. Taking the plant as a whole, it would be true that the size of the plant was always a bit ahead of the immediate demand, so that there was in that sense extra plant. In particular places, we might have arrived, at various times, at the condition where additions were necessary; that would be the regular course of busi-
ness.

506 I considered physical condition, inadequacy and abso-
lescence, as I have explained those terms. I did not take into consideration any retirements that may occur in the future, due to new inventions or discoveries. That was not part of my work. Nor did I take into consideration wear and tear in the future, or something that might occur subsequent
to the date of the inspection, but which had not yet hap-
507 pened. I took the condition as I found it at that time.
I did not speculate on what might happen in the future, nor did I consider at all the retirements of property that might occur subsequent to the date of the inspection because of physical changes, or because of future public requirements, or future changes in the public demand, or because of future losses that might occur through storms, and so forth.

I would not say positively that there have been no retirements of plant since 1923 due to obsolescence or inadequacy, but I do not think of any plant that has been retired on
account of its being obsolete. There have been changes
508 made in the central offices of various kinds. We have
introduced certain dial equipment in place of manual switchboards at some places, because, as I understand the situation, as a general overall matter, and considering the

cost of labor, it appears that dial operation under certain conditions may be more economical than manual operation. That does not mean that the manual equipment is obsolete. Some of the manual equipment that was taken out may have been re-used; some of it may not. I do not know in detail.

The manual equipment taken out of the Dearborn exchange is still standing on the floor, and will probably be used some time. Part of it is actually in use today for another purpose.

I believe that it stands in the Supply Account, or most of
509 it. The Delaware office is not now in use. I do not know whether the equipment from that office is still in the building, or where it is. I do not know whether it has been charged off or not, but I expect that it has; however, I cannot say that I know. My understanding is that most of the Dearborn office has been removed from the books, but part of it is still in use and remains on the books. The part displaced, I believe is in the Supply Account.

By the per cent condition that I have discussed and defined, I mean the same thing for each of the years appearing upon Plaintiff's Exhibit A-22. I have no working papers or any memos relating to this projection of the per cent condition from 1930 back through each year to and including 1923,
510 and there never were any. In coming to the conclusions in regard to the per cent condition for the years 1923 to 1929, both inclusive, and the year 1931, I talked the matter over with Mr. Hyatt, in respect to the equipment; with Mr. Riley, in respect to the outside plant; and with Mr. Young, in respect to the buildings. We came to the conclusion that, except for the accounts which I have mentioned, there had been no changes in the general condition which would be of sufficient importance to make a change in the per cent condition shown for the accounts. Mr. Hyatt and myself came to a conclusion with regard to central office telephone equipment, and so forth; and Mr. Riley and myself reached a conclusion in regard to exchange pole lines, and so forth.

I, myself, obtained the data in regard to general equip-
511 ment (Account 260), which includes Furniture and Fixtures, General Store Equipment, General Stable and Garage Equipment, and General Tools and Implements. In the

case of Furniture and Fixtures, I inspected the equipment and furniture in a number of offices, not attempting to make any calculations, but arrived at a conclusion as to the per cent condition.

512 Among the automobiles, there was a Lincoln car of the (I assume) 1927 model. That car had run 23,836 miles at the time I made my inspection. I gave that and two other cars of the same general type, an 88 per cent condition. That is, there was a Cadillac and another Lincoln involved in the same group, and I gave the group an 88 per cent condition. I do not think it is reasonably fair to pick out the one Lincoln and say it was in 88 per cent condition. I think that it

513 had run further than the others. The Cadillac ran 17,967 miles and the other Lincoln had run only a little over 2,000 miles. Then, obviously, by my method the 1927 Lincoln would have been figured, if it were figured separately, in a lower condition than the other two. I did not try to arrive at the then per cent condition of the 1927 model Lincoln limousine, taken by itself. I took the group as a whole. As applied to individual cars, the principle might not be good; but if I did attempt to arrive at the condition by individual cars for the purpose of illustration, I would do it the same

514 way. My postulate was that those three cars would probably run 150,000 miles, and the ratio of the number of miles that they had run to 150,000 miles would be the same as their per cent condition to 100; with a small adjustment that I can explain later, that would be true. I do not know the original cost of the Lincoln, but will accept the assertion that it was $5,862.60; I do not know that its estimated value on the market as of the 31st of December, 1930, was $775, but it would be somewhere around there, probably.

We were working on the actual inspection during Jan-

515 uary and February, and I think some parts of it ran into March. I don't remember exactly, but I think we finally came to the conclusions as to per cents condition that are expressed upon Plaintiff's Exhibit A-22 as late as August, possibly later.

Mr. Hyatt, Mr. Young, Mr. Riley and myself spent a great

deal of time together in conferences. After the inspection was completed, we discussed the exact methods and the details of translating the inspection into per cent condition. I think there are no written instructions other than those asked for.

516 *Re-direct Examination by Mr. Bracelen.*

The modification or adjustment to which I referred in my cross-examination, in connection with the condition of the Lincoln car, was explained by me in my direct testimony, in reference to the treatment of such things as tires and fan belts and some other items that are replaced from time to time.

517 ALBERT P. HYATT, a witness on behalf of the Plaintiff, having been previously duly sworn, resumed the stand and further testified as follows:

Cross-Examination by Mr. Haight.

Mr. Haight: Mr. Hyatt has produced, in response to our request, a sheet which gives the per cent condition of manual central offices by central offices, which I will ask be marked Defendants' Exhibit D-1.

And a group of sheets, eight in number, relating to the per cent condition of manual central office telephone equipment, the first one being Account 221, summary for Calumet office; the next one being Account 221, summary for Canal office; the next one, Account 221, summary for Dearborn office; the next, Account 221, summary for Delaware office; the next,

Account 221, summary for Merrimac office; the next,
518 Account 221, summary for Monroe office; the next,

Account 221, summary for Newcastle office, and the last, Account 221, summary for Tandem office, all marked as Defendants' Exhibit D-2.

And also instructions for the inspection of Central office telephone equipment January, 1931, entitled "General"; a second sheet with the same general title, and the sub-title "A and B Section frames." The next one, similarly headed,

entitled "Keys." The next one, with a similar legend, entitled "Cords." The next one, with a similar legend, entitled "Plugs." The next one, with a similar legend, entitled "Jacks." The next one, with a similar legend, entitled "Relays." The next one, with a similar legend, but entitled, "Message registers, condensers, repeating coils, resistances." The next, with a similar legend, entitled "Local position cable, short multiple cables, all other cables." Next, with a similar legend, entitled "Frames, racks, fuse boards." The next, with a similar legend, entitled "Jumpers, terminals, protectors." The next, with a similar legend, entitled "Test and repair desk, operating room desk." The next, with a similar legend, entitled "Storage batteries." The next, with a similar legend, entitled "Power machines." The next,
519 with a similar legend, entitled "Power boards, conduit wiring." All marked for identification Defendants' Exhibit D-3.

And also 14 pages of instructions upon the subject matter, "Instructions for the inspection of dial central office telephone equipment January 1931." We do not further identify each of the separate 14 pages, but they may all be marked Defendants' Exhibit D-4 for identification.

Also 4 pages of instructions, entitled "Instructions for the inspection of station equipment," all marked Defendants' Exhibit D-5, for identification.

Re-direct Examination by Mr. Bracelen.

In addition to the written instructions which I have identified, I have already testified on my direct examination concerning the classes that I conducted and the oral instructions which the men working under me received.

520 Mr. Haight: We asked Mr. Riley during his cross-examination for the sets of instructions used by him in his inspection work. They have just been produced by counsel. They are all bound together in a volume which, for identification, we will now have marked Defendants' Exhibit D-6, they being the instructions in regard to the various subject matters that were identified by the witness yesterday

during his cross-examination, and we will not further identify them now upon the record.

MAYNARD H. RILEY, a witness on behalf of the plaintiff, having been previously duly sworn, resumed the stand and further testified as follows:

Re-direct Examination by Mr. Bracelen.

In addition to the written instructions which have just been marked in evidence, I also held classes with men working under me at which we studied this subject, and I also
521 gave oral instructions to them. We had conferences, and there were numerous other oral instructions given in connection with the printed instructions. This was done both before and during the inspection.

Mr. Bracelen: May the record show Plaintiff's Exhibits A-19 to A-38 inclusive, received in evidence?

Mr. Haight: But before making objection, I would like to offer in evidence as part of our case even at this time, the exhibits that have been produced and identified by the witnesses just upon the stand. Then I wish to make an objection to Plaintiff's Exhibit A-22, this summary sheet. The objection relates to the per cent condition given for those years, 1923 to 1929, both inclusive, and also to the year 1931, upon the ground that there has been no proper foundation laid, and no proper showing made that makes these admissible in evidence. As for the rest, we have no objection
522 to the other exhibits. They are entitled to their theory of the case, and I think they should be received.

The Court: As to the exhibit to which you object, it certainly is no more than it purports to be, and the evidence in the record shows the basis for the tabulation. I think it is a question of its weight, rather than its admissibility. You can save your point, and I will overrule the objection, and admit the documents in evidence.

Mr. Haight: All right. Exception.

523 Defendants' Exhibits marked D-1 to D-6, inclusive, received in evidence.

525 L. R. MAPES, a witness on behalf of the plaintiff, having been first duly sworn, was examined and testified as follows:

Direct Examination by Mr. Thompson.

My name is L. R. Mapes. I live in Evanston. I have been employed by the plaintiff in this case, the Illinois Bell Telephone Company, as Chief Engineer of the Chicago area since March 1, 1928. Prior to that time, I was Equipment and Building Engineer for the whole Company from July 1, 1925, until I became Chief Engineer. Prior to my employment by the Illi-

526 nois Bell Telephone Company, I had been employed by the American Telephone and Telegraph Company from August 1, 1913, until I came to the Illinois Bell Telephone Company in July of 1925. I was employed by the American Telephone and Telegraph Company as an engineer in its Engineering Department in New York City, which later became the Department of Operation and Engineering.

Since my employment by the plaintiff, I have been and am now familiar with the physical property and plant of that Company in its Chicago area, including its real estate and buildings, and with the actual use to which that property has been and is being put in the handling of both the intrastate and the interstate business of the plaintiff in its Chicago area. Except, perhaps, for a small portion of the total plant, the books and records of the Illinois Bell Telephone Company do

527 not show upon their face a division, apportionment or separation of the property of the Company as between that used in the performance of its intrastate functions, and that used in the performance of its interstate functions.

I have made a separation and apportionment of the property of the plaintiff Company in its Chicago area as of December 31, in each of the years 1923 to 1931 inclusive, between the use of that property in its interstate business, and in its intrastate business. To obtain the information used in making this separation, I examined the records of the Company, particularly the plant records. I also had collected and prepared under my direction, a large amount of data from the traffic records.

The work of making the separation for the years 1923 to 1930, inclusive, was started early in January, 1931. The
528 work on this separation was finished shortly before August of 1931, but I have done a very substantial amount of work since that time in reviewing the data. Later I undertook the further work of separating the property of the Company as to its respective uses in intrastate and interstate service for the year 1931. The work of making this separation was started in December of 1931. There were certain data that were not available until January of 1932, but we carried it on continuously from the time we started in December until it was completed, I think late in January of 1932, at which time we turned over our results to Mr. Kruse, General Accountant of the Company, for his further use.

My chief assistant in doing this work was Mr. H. A.
529 Harris, who is Plant Extension Engineer for the State area of the Illinois Bell Company. He has been employed by that Company for the past twenty years. Mr. Harris and I had at least 150 different people working on the separation at various times. I think that it can be expressed this way: there was the equivalent of about 40 people working continuously for six months. We examined records taken in the regular course of business, for all of the years involved
530 in the separation. The records were very bulky and would, I think, fill at least a very good sized truck.

On the former trial of this cause, a separation was made of the Company's property as between its interstate and intrastate uses by the so-called board-to-board method. Under that method of separation, the property is first separated between its toll and local uses by allocating to toll, the toll switchboard, the toll lines, the toll trunks connecting the toll switchboard with the local switchboards, and that part of the local switchboards used for A-B toll service. Under this board-to-board method, the subscribers' stations, subscribers' lines, and that part of the local central offices used for completing calls, both local calls and calls connecting the subscribers' lines with the toll trunks, was treated purely as

exchange property. The exchange property was all considered as intrastate property. The toll property, which I have previously mentioned, was then separated between interstate and intrastate, on the basis of use of the toll property.

531 In Chicago, there is a very large volume of short haul toll calls, which it is very desirable to handle as nearly like exchange calls as possible, that is, without routing them through the toll board. These calls are handled by the exchange operators, for example: the A operator in the originating exchange, the central office where the call originates, passes this call to the B operator in the exchange where the called line is terminated. This may be done either directly by means of direct trunks between the two offices, or it may be done via the Tandem board. This is called A-B toll service. In the main, it is short haul toll business.

532 In this case, I have not used the so-called board-to-board method of separating plaintiff's property between its interstate and intrastate uses, as I have just described it, and which was used at the former hearing. I have made the separation here by the so-called station-to-station method. The general result of this method of separation is that all the property is separated or apportioned to interstate and intrastate uses, in accordance with its respective uses for those services. Included in that property is not only that which was separated in the other case, but also the subscribers' station apparatus, the subscribers' lines, and the local central office equipment.

These separations were made as of December 31, in each of the years involved in this cause, that is, 1923 to 1931.

533 Wherever property was used exclusively for interstate service, it was put in the interstate class. Wherever it was used exclusively for intrastate service, it was put in that class. The property which was used jointly for both services was apportioned to intrastate and interstate, on the basis of the respective use made for those purposes.

The Illinois Bell Telephone Company divided its property, for operating purposes, into two areas on March 1, 1928. Those two areas are called "Chicago area" and "State

area." There is included in the Chicago area the property within the city limits of the City of Chicago. All other property of the Company is included in the State area. There may be a very few minor exceptions to this general rule, but, if any, they are of no practical importance in this separation.

534 In separating and apportioning plaintiff's property in its Chicago area as between its intrastate and interstate uses, I have included all of the property of the Company located in the Chicago area, irrespective of the use to which the property was put. There is property in the Chicago area which is used, in part, for State area purposes, and also property in the State area which is used, in part, for Chicago purposes. In making my separation and apportionment, it was impossible to exclude from the property separated and apportioned that small part of the property in the Chicago area used in part for State area purposes, and to include that relatively small part of the State area property used for Chicago purposes. I made no compensation for the use of Chicago property for State area purposes, or for State area property used for Chicago purposes. I did, however, furnish Mr.

535 Kruse, the General Accountant of the Company, the necessary data that he needed, in addition to that which he already had, to make proper compensation for these respective uses. I believe he did make a proper compensation for these uses.

The exhibit identified as Plaintiff's Exhibit A-39, which shows schematically the property and plant in the Chicago area of the Illinois Bell Telephone Company used separately for intrastate and interstate purposes, and used jointly for both purposes, was prepared under my direction and supervision.

536 The color scheme, as shown in the upper right hand corner of this schematic plan (Plaintiff's Exhibit A-39) indicates the uses to which the offices and connecting property was put. For example, the toll lines which connect the toll office to offices in other States (such as Wisconsin) and are, therefore, being used for interstate purposes, are shown by the solid

blue lines. The interoffice trunks connecting the local offices within the City of Chicago, and used for exchange calls, which are intrastate, are indicated by the green lines. The property which was used jointly for interstate and intrastate service, such as the subscribers' stations and the local central offices, are indicated in red. The property which was used wholly for intrastate toll uses, such as the Tandem trunks between the Tandem office and the offices outside of the City, are indicated in dashed blue lines. The property used
537 for both intrastate and interstate toll services, such as certain toll lines connecting the toll office to other offices outside the City, are indicated by blue dot-dash lines.

Telephone service is provided in Chicago by 32 local central offices, each serving the subscribers in a relatively small area. We have only shown three central offices on this schematic plan, so as to make it clearer. The subscribers' stations are connected with the local central office by one or more pairs of wires. Each local central office is connected with the other local central offices in the City by interoffice trunks used for exchange calls, which are intrastate. It is connected with the toll office by recording trunks and toll switching trunks,
538 indicated here by the blue dot-dash lines, and is also connected with the Tandem office by Tandem trunks, indicated by the red lines. The central offices are also connected with offices outside of the City of Chicago by direct A-B trunks, as indicated by the blue dash lines here (indicating). These particular trunks go to another office in the State of Illinois, and are intrastate. There are also trunks from some of these local central offices going to points in Indiana, which are interstate points.

The Tandem office is used principally for handling short haul toll calls between points where the volume of calls
539 is relatively small. It is also used to some slight extent for exchange calls under similar circumstances. Most of the central offices in the City of Chicago have such a substantial volume of traffic with the other central offices in the Chicago area that there are direct trunks connecting the two offices. There are, however, certain portions where there is not

enough business between two offices to justify direct trunking connections between the two, and in these cases the Tandem office is a device by which we collect the calls from these various local offices and distribute them to the other local central offices, where there is not the need, owing to the volume of traffic, for a direct connection. In this way, the Tandem office handles not only local exchange calls, but also a substantial portion of the A-B toll calls.

540 The toll office is used primarily for the longer haul toll calls; both calls to other points in the State of Illinois, and to other States. The connections of the toll office are not only with cities in Illinois, but with cities in other States.

Exhibit A-39 does not attempt to show any more than schematically the Company's property in the City of Chicago. We have not attempted to show by the number of symbols or lines on the chart the actual quantities of the various types of equipment.

541 An exchange call which is classed as intrastate, originates at the subscriber's station, indicated by the red circle, is carried over the subscriber's line, indicated by the red line, to the A board at the local central office, indicated by the red rectangle. Now, in some cases that call may then be carried from the A board in this local central office to the B board in the same local central office, and from there out over the terminating subscriber's line to the terminating subscriber's station. In other cases, it may go from the A board of the local central office over the interoffice trunks (indicated by green lines used for exchange, that is, intrastate service), to the B board in some other local office, from whence it is completed over the subscriber's line to the subscriber's station. A local call may also be handled in the exact manner which I have described, the only difference being that it would go through the Tandem office, but that applies to only a very small proportion of the total exchange calls.

542 Toll calls are handled by any one of three different methods: first, by means of A-B direct trunks. Starting as before with the subscriber's station, the subscriber's line, the A board in the originating local central office; from

thence over an A-B trunk to the terminating office, which may be in Illinois, in which case the service is an intrastate service, or which may be in Indiana, in which case the service is an interstate service; and from this office then to the terminating subscriber's line and subscriber's station.

A second method of handling toll calls is through the Tandem board. Starting as before with the subscriber's line and subscriber's station, the A board in the local central office, from thence over an originating Tandem trunk to the Tandem office, and from the Tandem office over a com-
543 pleting Tandem trunk to an office outside of the City, which may be either interstate or intrastate. In the case of interstate, the Tandem trunks here are shown in solid blue lines, and in the case of the trunks between the Tandem office and the local central offices they are shown in red lines, because they may be used for either interstate or intrastate service.

The third method of handling calls is through the toll office. Starting as before with the subscriber's station, the subscriber's line, the local central office, thence by recording or toll switching trunks to the toll office, and from there to offices at distant points, over either interstate toll lines, as shown in solid blue, or over joint interstate and intrastate toll lines, as shown by the dash-dot lines.

544 The A-B toll calls were approximately 81 per cent of the total toll calls in the year 1930.

Any calls which cross the State line are classed as interstate calls. Other calls are classed as intrastate. Exchange calls are classed as intrastate with one minor exception, which occurs in the case of so-called foreign exchange lines. Foreign exchange service is service given to a subscriber from an exchange other than the one to which he would normally be connected, for example, a subscriber in Gary, Indiana, would normally be connected with the Gary exchange. Now, for some reason he wishes to be connected with the Chicago exchange, so that we actually do connect his telephone to a central office in the Chicago exchange, and that particular service and that particular line is known as foreign

545 exchange service and foreign exchange line. Where calls moving over foreign exchange lines come from stations located outside of Illinois, we have treated them, in the various computations which we have made in the preparation of our exhibits, as interstate calls.

I have prepared an exhibit which shows in some detail the methods used in the separation and apportionment of the property of the Illinois Bell Telephone Company in its Chicago area, as between intrastate and interstate use, and also the method of apportionment of operators' wages and transmission power, furnished by me to Mr. Kruse, the General Accountant of the Company, for his use in the separation and apportionment of those expenses of the Company. That exhibit has been identified as Plaintiff's Exhibit A-40. It was prepared in connection with the separation of the Company's property in its Chicago area for the years 1923 to 1930.

This Exhibit A-40, or copies of it, were submitted to the defendants in this cause for their examination and inspec-
546 tion on August 1, 1931. The underlying data upon which this exhibit is based have been available for the inspection of the defendants and their counsel, and is now available for their use. The data I used in making the separation for the year 1931 have also been available for inspection by the defendants.

The methods which I used in separating and apportioning the property of the Company for the year 1931 were identical with the methods which were used for making the separation of the property for the earlier years, as such methods are set out in Exhibit A-40. In connection with the separation of transmission power expense for the year 1931, we did not make a new study to obtain the relative drain as between intrastate and interstate uses for that year. We assumed
547 that the drains were proportionately the same as they were in 1930. In my opinion as an engineer, that is a very fair assumption to make.

By the methods which I have used, as set out in Exhibit A-40, I have separated and apportioned the entire property of the Illinois Bell Telephone Company in its Chicago area

for the various years shown in these exhibits, on the basis of the actual uses to which that property is put, viz., its intrastate and its interstate uses. In my opinion, the methods which are set out in Exhibit A-40, and which I have used, are proper and accurate methods for the purpose of accomplishing the kind of separation to which I have just testified.

When the percentages of such respective uses (interstate and intrastate), which I have obtained for each of the years 1923 to 1931, are applied to the fair value of the property as it shall finally be found by this Court, the resultant dollars will give the value of the interstate and intrastate property of the plaintiff in its Chicago area on the basis of such use.

548 In the exhibits which are to be introduced, I have made the separation, not only on the dollar basis, but on the percentage basis, for the property in its entirety for each of the years, and for each plant account.

The exhibit which has been marked Plaintiff's Exhibit A-41, consisting of eleven sheets, was prepared under my supervision and direction. Page 1 of this exhibit shows an apportionment of the reproduction cost new of the plaintiff's property in Chicago, to intrastate and interstate uses, as of December 31 of each of the years 1923 to 1930, and the same information with respect to the year 1931 is on the

549 second sheet. These first two sheets are summaries showing the apportionment of reproduction cost new for each of the years by dollars, as between intrastate and interstate use, and also an apportionment on the percentage basis. Sheets 3 to 11 of Exhibit A-41 show the separation by dollars and by percentages, broken down by plant accounts and sub-accounts. The dollar figures representing the cost to reproduce new, which have been apportioned in this Exhibit A-41, were obtained from the exhibits prepared and already intro-

550 duced in evidence in this case. That would include, of course, Mr. Sloan's exhibits, Mr. Renwick's exhibits and Mr. Huston's exhibits. The dollar figures appearing in this Exhibit A-41 include the cost to reproduce the physical property, including undistributed construction costs and general equipment, but excluding going value, cash working capital,

construction work in progress, and materials and supplies.

551 Sheets 1 and 2 of Exhibit A-42 show an apportionment of the property of the plaintiff in its Chicago area, based on the reproduction cost new, less depreciation. This apportionment is for each of the years 1923 to 1931, inclusive, and shows the apportionment by dollars, and also the apportionment by percentages. These sheets 1 and 2 are summaries. Sheets 3 to 11 are apportionments, both on a dollar and a percentage basis, but broken down by plant accounts and sub-accounts, there being one sheet for each year. We

552 obtained these dollar figures on Exhibit A-42 by making the separation of the cost to reproduce new as between intrastate and interstate uses first, and then applying to such separated dollar figures the conditions per cent obtained from Mr. Redmund's exhibits.

The dollar figures included in Exhibit A-42 were also obtained, so far as the cost to reproduce new is concerned, from the exhibits which have already been introduced in this case, and we separated, so far as dollars are concerned, on Exhibit A-42 the same things which were separated on A-41, that is, cost to reproduce new, plus structural overheads, plus general equipment, but not including going value, cash working capital, materials and supplies or construction work in progress.

553 The methods which are outlined in Exhibit A-40 apply equally to the work which was done in connection with Exhibits A-41 and A-42, and were followed by me in compiling the figures obtained on both of these exhibits.

These two exhibits, A-41 and A-42, other than the figures contained in them with respect to the year 1931, were furnished the defendants' counsel on or about the first of August, 1931. My 1931 work was furnished to the defendants' counsel some time around or after February 1 of this year.

I have prepared very recently at counsel's request two exhibits, identified as Plaintiff's Exhibits A-43 and A-44. These exhibits have not been submitted to the defendants in this case. Exhibit A-43 shows an apportionment of the property of the plaintiff, based on the reproduction cost of the

property, in accordance with the testimony that I have
554 previously given. Exhibit A-44 is a summary similar to sheets 1 and 2 of Exhibit A-42, and shows the reproduction cost new less depreciation, separated between intrastate and interstate uses. These two exhibits differ from Exhibits A-41 and A-42 in one respect only. In these last two exhibits, being Exhibits A-43 and A-44, we have excluded all overheads on land. In these two new exhibits, I have made a separation on the same basis that I used in the preparation of my other separation exhibits, and the only difference is that in the preparation of A-43 and A-44, at the direction of
555 counsel, I have excluded all overheads on land. The overheads on land were furnished to me by Mr. Sloan.

The Court: Are they in some exhibit here?

Mr. Thompson: They are, your Honor. The undistributed construction costs are, as I recall it, included in Exhibit A-12, and they show there the spread to the several accounts and sub-accounts, including land; and I understand Mr. Mapes to say that he has taken the overhead which Mr. Sloan applied to the land account and excluded it in preparing Exhibits A-43 and A-44.

The Witness: That is right.

The Court: All right. Why did you do that?

Mr. Thompson: In a reproduction cost new, we would actually have incurred the expense of interest during construction, taxes during construction, and so forth, with respect to land. There is, however, in the Minnesota Rate Case a statement by Mr. Chief Justice, then Mr. Justice Hughes, dealing with the question of overheads on land. In that particular case, the railroads were contending that they would take the fair market value of adjacent lands, and because of the expense of segregation, and the value for railroad pur-
556 poses, they would apply a multiplier of 2½ in order to get the market value of lands up to the place where the special value for railroad purposes would be fairly met by the application of this multiplier.

Then, on top of that, they put on certain undistributed construction costs. Frankly, in view of that language, we felt it

was essential to bring to your Honor here exhibits which would show this separation, based not only upon lands including overhead, but on land excluding overhead.

The Court: So that if we decided to take the statement of that case, we would have the figures before us?

Mr. Thompson: The basis upon which it could be done. I want your Honor to understand clearly that we believe the language of the Court can be distinguished in that case from the facts in this case, but if your Honor should conclude otherwise, we don't want you to be without the basis upon which you can proceed.

The Court: So that there will be no delay?

Mr. Thompson: Yes.

All the exhibits which have been introduced purporting to show a separation and apportionment of the plaintiff's property as between its intrastate and interstate uses, accurately and correctly reflect, in my opinion, the separation in dollars,
and also on a percentage basis, of the property of the
557 plaintiff in its Chicago area (exclusive of going concern
value, materials and supplies, cash working capital and construction work in progress), as between its intrastate and interstate uses, on the several bases to which I have testified.

558 The exhibit identified as Plaintiff's Exhibit A-45 consists of six sheets, and is a list of the traffic data which we used in the separation of the property between its intrastate and interstate uses. This is substantially a compilation in exhibit form of information listed in Exhibit A-40. I think substantially all of those items indicated in Exhibit A-45 are referred to in Exhibit A-40. Exhibit A-45 really shows a rather complete list of the traffic data to which we resorted in making the separation of the plaintiff's property on the basis of use.

The data contained in the exhibit identified as Plaintiff's Exhibit A-46, which is in ten sheets and which relates to call volumes and time intervals in the local central offices in the Chicago area of the plaintiff for the years 1923 to 1931, both inclusive, were compiled under my direction for use, and were

used by me in the separation of the plaintiff's property in its Chicago area in each of the years. The first sheet of this
559 Exhibit A-46 contains the data for the years 1923 to 1930, and sheet 2 shows the similar data for 1931. The information in this exhibit was compiled principally for use in separating that part of the property jointly used for intrastate and interstate service, such as the subscribers' lines and subscribers' stations.

The data which are covered on sheets 1 and 2 of this exhibit (A-46) show, in the first column, total calls originating in local central offices in the City of Chicago for each of the years. In the subsequent columns, these calls are broken down into certain major classes, and each class is subdivided where necessary between intrastate and interstate. The exhibit also shows the total calls originating in all local central offices split between those originating in manual offices
560 and those originating in dial offices.

The total originating calls in central offices in the City of Chicago combining both the manual and the dial offices, and all sorts of calls which were used for the purpose of making this separation, exceed a billion in each of these years. All of the data with respect to all of these calls, aggregating more than a billion a year, were collected and compiled and classified as between intrastate and interstate in the separation of the Company's property.

Sheets 1 and 2 of this exhibit (A-46) not only show the total calls broken down by various classes, but also show the percentages of total calls in the various classes used for intrastate and interstate where such separation is necessary. Sheets 3 and 4 show for each of the years 1923 to 1931, a further subdivision of the originating calls, and also show the number of incoming calls in total to all local offices
561 in the City, and these figures also are all broken down between those incoming to manual offices, and those incoming to dial offices. Sheets 5 and 6 show the time use per call for the various classes shown on the previous sheets.

In apportioning and separating the plaintiff's property, I not only obtained the total number of calls of the various

kinds, that is, exchange, interstate toll and intrastate toll, but also obtained the time intervals and use with respect to each of those classes of calls, so that I could weight out that factor of use, not only by the number of calls, but on the basis of the actual time the subscriber's line was held, or the talking time, or whatever the proper method is. The detail of how I did that appears on Exhibit A-40 with respect to each class of the Company's property which, in my opinion, is fully explanatory of the situation.

562 Sheets 7 and 8 (Exhibit A-46) show the total time use for the various classes of calls, obtained by multiplying the number of calls by the time in use per call. That has been subdivided as shown on the exhibit. Sheets 9 and 10 show the total minutes use for interstate and intrastate service, and the resulting percentages, which indicate the per cent use of the property for interstate and intrastate service.

Exhibit A-46 does not contain a summarization of all the traffic data which were used in making this entire separation. This particular set of figures in Exhibit A-46 was obtained in order to separate the subscribers' lines and subscribers' stations and related property. These data are typical of those which were used in the separation and apportionment of the other types of property. All of those data are contained 563 in my work papers, and have been used by me in making the separation, depending upon the exact character of the property that I was separating and apportioning, all as shown in Exhibit A-40, which is the method exhibit.

When we got the call volumes and the time intervals set out in Exhibit A-46, we applied the percentages arising therefrom to the subscribers' lines and subscribers' stations, and certain other related property which had the same use as the lines and stations. I obtained other call volumes and time intervals in order to apply percentages arising therefrom to other property used generally for interstate and intrastate purposes.

The dollar figures which appear on the several exhibits, showing the separation of the plaintiff's property as between its intrastate and interstate uses, were not altogether derived

by applying these call volumes and time intervals to the property, because we first allocated or apportioned to toll use any property used exclusively for toll. Similarly, any property used exclusively for exchange use we first apportioned or allocated to such exchange use. The balance of the property which was jointly used was separated in accordance with
564 the actual time use of such property for the two respective services.

I furnished data for the use of Mr. Kruse, the General Accountant of the Company, in separating two of its expense accounts. These expense accounts were Transmission Power, which is Account 628, and Operators' Wages, which is Account 624-11. Account 628, Transmission Power, covers the cost of power purchased for transmitting traffic, operating signals, the cost of renewing local and central office batteries, and the cost of labor employed and supplies consumed in operating the generating and storage battery plants. Transmission power is regularly accounted for as a separate item of traffic expense.

The basis upon which this separation of transmission power expense was made is covered in Exhibit A-40, in
565 a general way. We have certain basic current drain figures for the various classes of calls. By multiplying out the total number of calls in each class by the current drain required per call for that particular class, we can arrive at the total current drain for that class, and the current drain total for all classes, and thereby obtain a percentage which can be used in dividing the transmission power expense. This was done so that we could get the percentage which was applicable to interstate calls and intrastate calls separately. "Current drain" is an engineering term, and is generally expressed, I think, in our work, in ampere seconds. It represents the number of amperes of current flowing from the battery, multiplied by the number of seconds that those amperes flow. If one ampere was flowing for one second, it would be one ampere second. The basis of the separation
566 which I have made of this transmission power expense as between interstate and intrastate is to obtain, in the

method I have indicated, the amount of power used respectively for the two uses.

Account 624-11 is Operators' Wages. We use in the regular course of our business certain factors technically known as traffic coefficients, which are proportional to the amount of operating labor required for various classes of calls. Now, by multiplying out the number of calls in the various classes by the coefficients applicable to those classes, we could get the total labor units expended in handling traffic. We could get the separation of that into the various classes of calls, and from thence a separation into interstate and intrastate, on a percentage basis.

To explain a traffic coefficient by example: a relatively simple call is represented by a coefficient of 1. An operator, in a busy hour, can handle about 230 of those calls. Now, a somewhat more difficult call, which takes twice as much operat-
567 ing labor as a simple call, will be represented by a coefficient of 2, so that, in effect, she could handle about 115 calls in the busy hour of that particular type. All the various classes of calls have various coefficients, depending on the amount of labor required by the operator in completing the call and disconnecting the subscriber. The actual work done by the operator with respect to these classes of calls is accurately measured by these coefficients. The method which I have used in apportioning this item of traffic expense of operators' wages is one which results in making a just and proper apportionment of it between intrastate and interstate expense on the basis of the respective time devoted by the operators to those two given services.

568 I am familiar with each of the parcels of real estate and leasehold interests which are described in Exhibit A-18 and which have been appraised by Mr. Huston. I am also familiar with the use to which these parcels of land have been and are now being put by the Illinois Bell Telephone Company. These respective parcels of land, and the leaseholds shown for the year 1931, are actually now used either as locations for the business offices or exchanges of the Illinois Bell Telephone Company in its Chicago area. There

are three exceptions where there are no buildings on vacant parcels of land at the present time. These are tracts 29, 34 and 35.

569 Tract 29 is located at 813 East 44th Street. It was acquired in 1918 as a site for the new Oakland central office to take care of the very rapid growth which was being experienced in that area. After this real estate was acquired, there was a change in the situation which resulted in a temporary postponement of the use of the real estate. The growth was not what we expected it to be in that particular area, which, I think, is very largely given over to a negro population at the present time, so that we have not yet built a building upon this particular parcel, but the Company retained this property for the purpose of erecting a building upon it in the future. It is contemplated that such a building will be erected in the next four or five years.

570 Tract 34 was acquired in 1929, and is located at the northwest corner of 75th Place and Stony Island Avenue. It was acquired for a new central office to relieve the very rapidly growing South Chicago, Hyde Park and Stewart offices. When this tract of land was acquired in 1929, the Company had a definite plan for erecting a building there; we expected to start the erection of the building in 1930. That building was not commenced because of the very much smaller demand for telephone service on account of business conditions. The Company now intends to use this tract to which I have just referred in the near future for the construction of a telephone building; probably in 1935.

571 Tract 35 is located at the northwest corner of 64th Street and Cicero Avenue, and was acquired by the Company in 1929. It was acquired for a new building to relieve the rapidly growing area served by the Prospect and LaFayette offices. At the time of its acquisition, it was expected to start the construction of a new building in 1930. That plan was not carried out, also due to the lessened demand for telephone service in that area. The Company at this time has a definite plan for the use of this tract of land for a telephone building; we expect to start the erection of a building in 1935.

Land was purchased for a new Monroe dial office in the
572 fall of 1931. It had a few old buildings on it, of no value.
We started construction on this property during the last few days in December of 1931. Of course, the construction has not been completed yet, and the equipment has not been installed, or the office cut over. The foundations are just being completed. Work is to be prosecuted in the immediate future on the completion of that building.

There are parcels of real estate included in the Huston appraisal identified as Exhibit A-18 on which there are buildings used for telephone purposes, but which are also occupied in part by buildings not used for telephone purposes. They
are tracts 1, 9, 14, 21, 22 and 33. I have prepared a list
573 of the parcels of land, to which I have just referred, giving the dimensions of real estate, the dimensions of the buildings used for telephone purposes, the dimensions of buildings used for other than telephone purposes, and the purposes for which such latter buildings are used. (This document was identified as Plaintiff's Exhibit A-47.)

This exhibit shows enough information so that it is substantially self-explanatory. All the buildings not used for telephone purposes, which are located on the tracts to which I have referred, were already constructed on the real estate at the time it was purchased.

With respect to all of the tracts of lands included in the Huston appraisal, the Illinois Bell Telephone Company has not purchased more property than is reasonably necessary for the several exchanges located on these parcels of land for
these reasons: we plan our buildings so that it is pos-
574 sible to extend them, and we must protect ourselves by having adjacent land on which those extensions can be made. In certain cases, the zoning ordinances require us to have more land than that which is actually occupied by the building. In my opinion, the Company has not purchased land for extension in excess of its normal requirements for telephone service.

Tracts 6 and 42, included in the Huston appraisal for certain years, were not used for telephone buildings, and were

subsequently sold by the Company, or taken out of its operating property. Tract 6 was purchased in 1917. It was acquired for an office to take care of the fairly rapidly growing Canal area, but the growth was not what was anticipated. In 1929, we took that property out of our operating properties, and also out of the appraisal. Tract 42 was ac-
575 quired in 1919 to relieve the fast growing Wentworth area. We later determined that that particular property would not be needed, so part of it was sold and the balance was taken out of our operating property.

In my opinion, and as a result of my knowledge of all of this property, the real estate, the leasehold interests, the buildings and the operating telephone property, are used and useful, and were used and useful by the Illinois Bell Telephone Company in rendering service to the public in its Chicago area during the period of time in which it has owned this property.

576 ALLEN G. HOYT, recalled as a witness on behalf of the plaintiff, having been previously duly sworn, further testified as follows:

Cross-Examination by Mr. Goldstein.

577 I am, at the present, one of the officers of the National City Bank, having charge of the investment of trust funds, and of the review of investments. In connection with my duties as such, I have had occasion to compare the various classes of securities, and to compare the relative merits of bonds versus stocks, and to compare the merits of various classes of bonds. I find some bonds that I consider as high grade, some bonds that I consider as medium, and some bonds that I consider as speculative.

I also give consideration to the restrictions that may exist by statute with reference to bonds available for invest-
578 ment in trust funds. I also consider the various classifications, the various requirements, and the various attributes of bonds, apart from the statutory restrictions,

which have become impressed upon the investors and upon me as a banker in connection with my selection of securities for investment. In connection with my determination of these various classes and types of bonds, I have occasion to consult various sources in order to procure the data upon which I form my judgment. Some of those sources are established manuals, annual reports of companies, and the services of statistical companies. The established manuals to
579 which I referred are Poor's Manuals, Moody's Manuals, Standard Statistics, and so forth. The services include Standard Statistics, particularly, and Moody's.

In connection with the various classes of securities, investors have come to think of bonds in certain classifications: bonds legal for savings banks and bonds not legal. They have also come to think of the classifications in the terms in which some of the established services have rated them, that is, as A-1 bonds or as Triple-A bonds. Many investors have in mind those ratings in connection with the type of securities purchased.

580 We have as fields for bonds, the savings bank, the trust funds, the so-called conservative investor, the so-called speculative investor, and the so-called business man risk investor. And all of these various classes of investors do not buy the same kind of bonds. The savings banks, the trustees, and the conservative investors are very likely to confine their purchases to bonds of the general character rated by Moody as Triple-A bonds. Generally speaking, the trust funds would confine their purchases to Triple-A bonds. The conserv-
581 ative investor would buy a higher-rated, or more conservative bond than the speculative investor.

There are circulars issued by the National City Company in connection with the issues in which it participates, or originates. The circulars which have been handed to me are, I think, very similar to circulars issued by the National City with regard to bond offerings. These circulars include one concerning $125,000,000 of American Telephone & Telegraph Company, 35-year Sinking Fund, 5 Per Cent Gold Debentures,

identified in the margin as Defendants' Deposition. Ex-
582 hibit 104. It is typical of its class. There is also a circular entitled: "$150,000,000 American Telephone & Telegraph Company, 35-year, 5 Per Cent Gold Debentures," identified as Defendants' Deposition Exhibit 106. Another one is entitled: "$50,000,000 Illinois Bell Telephone Company First and Refunding Mortgage 5 Per Cent Gold Bonds, Series A," identified as Defendants' Deposition Exhibit 145.
583 Another is entitled: "$100,000,000 American Telephone & Telegraph Company, 35-year Sinking Fund, 5.5 Per Cent Gold Debenture Bonds," identified as Defendants' Deposition Exhibit 105. Another is entitled: "$25,000,000 International Telephone & Telegraph Corporation, 20-year 5.5 Per Cent Convertible Gold Debenture Bonds" (which was marked Defendants' Exhibit D-7 for identification). There is also a circular entitled: "$40,000,000 New England Telephone & Telegraph Company First Mortgage 4.5 Per Cent Gold Bonds, Series B" (which was marked Defendants' Exhibit D-8 for identification).

These circulars, and the circulars which the National City Company issues, contain the information which the ordi-
584 nary investor usually looks at in making his investment. They contain the pertinent facts which the bankers believe would be of interest to the prospective buyer, and the letters contained in these circulars directed to the bankers, contain certain information that the banker desires to have in connection with his resale of the securities purchased.

The ordinary investor, in addition to the market condition and the kind of industry, looks at the ratio of the credit obligations to the total book value of the assets. He also
585 looks at the ratio of earnings available for interest requirements over a period of years, and at the amount of book value of the assets behind his obligations. The ordinary investor who invests in capital stock of a company, would look at the amount of outstanding credit obligations ahead of his security. He would also look at the amount of book value of the assets behind his security, and at the amount of earnings available for dividends after deducting interest,

and all prior charges. He would also look at the per cent of the total earnings available for dividends, which are paid out in dividends. He would also look at the amount of book value and assets which are used to earn the amount of money which is required to pay his dividends and the extra amount added to surplus.

586 The liabilities on the balance sheet consist of capital liabilities, bonds and stocks, surplus items, premium on stock, and reserve; those are the principal items. When I say these show on the liability side, I do not necessarily have in mind that, in determining the ratio of the assets available for his stock, or his investment in the company, I would deduct the reserve for depreciation from the plant assets, on the assets side. Some companies carry the reserve for depreciation against plant as a deduction on the assets side. Very few public utilities, as far as I am aware, make a deduction from their plant account on the assets side. Some indus-

587 trials do. If they are carried on the liability side, and the assets side carries the gross plant, the amount of assets represented by the reserve is helping to earn the money necessary to pay the dividends, provided the total assets on the assets side are invested. In considering the total assets that are used to produce the required earnings, we consider the total assets before the depreciation deduction.

An investor may give consideration to the fact that perhaps the actual value of the assets may be greater than the book value. He certainly gives consideration to the fact

588 that reproduction may be more or less than the book value. In determining the amount of assets which are used to produce the income, for instance, in determining whether it is 8 times the interest requirement or 4 times the dividend requirement, and so forth, the only figure that is available to the investor is the book value of those assets. Of course, the investor and particularly the stock buyer might give a great deal of consideration to the fact that since the plant was built up, construction cost has increased, and there were good grounds to believe that the duplication value

greatly exceeded the book value. In determining whether
589 the assets will earn 4 times the dividend requirement or the interest requirement, or the total earnings available for interest or for dividends, the investor may compute his ratios upon the basis of the earnings to the asset values as shown on the books of the company.

"Q. Now, you were asked five questions on direct examination, and I will repeat them to you. The first question was:

'Question: Have you become familiar with the returns that were and are being made by various enterprises in securities in which your company dealt?'

590 "And the answer was:

'Answer: I have.'

"The Witness: In a general way that is true, yes.

"Mr. Goldstein: Q. Yes. I am just—I just want to repeat these questions, and then I will predicate some questions on the basis of your answers, later on. The second question was:

'Question: Have you become familiar with the returns which are being made generally in this part of the country, on investments in public utilities and other businesses?'

"And your answer was:

'Answer: I think I am.'

"And the question then was:

'Question: In your opinion, Mr. Hoyt, what return must a telephone company such as the Illinois Bell Telephone Company earn on the value of the property which it employs for the convenience of the public in Chicago, in order that such return shall equal that generally being made at this time, in this part of the country, on investments in other business undertakings which are attended by corresponding risks and uncertainties?'

'Answer: At the present time?'

'Question: Yes.'

591 "And you answered:

'Answer: More than 8 per cent.'

"Then the question was asked:

'Question: In your opinion, what return must a telephone company such as the American Telephone &

Telegraph Company, doing a nation-wide business; earn on the value of the property which it employs for the convenience of the public, in order that such return shall equal that generally being made at this time, in this country, on investments in other business undertakings, which are attended by corresponding risks and uncertainties?'

"And the answer was:

'Answer: In excess of 8 per cent.'

"Then the question was:

'Question: Now, Mr. Hoyt, would you state the return which a telephone company such as the Illinois Bell would have to earn during the period beginning with 1923, and continuing down to 1931, stating the return by years, assuming the same conditions that I asked you about with regard to the present time.'

"And your answer was:

'Answer: I think that the return in 1923 would have had to have been 8 per cent; in 1924, 8 per cent; in 1925, 8
592 per cent; in 1926, 8 per cent; in 1927, 8 per cent; in 1928, 7 per cent; in 1929, 7 per cent; in 1930, 7 per cent. In 1931 I think the situation changed towards the latter part of the year, and the return during the latter part of the year would have had to have been increased to 8 per cent.'

"Now, those were the questions and the answers. What I would like to ask you is this: What did you understand by the word 'property' as used in each of the questions?

"A. The fair value of the property. As I take it, a utility is entitled to rates which will produce net earnings equal to a reasonable return on the fair value of the property."

I understood the word "property" in those questions to be whatever the value should be. If you are going to enlist capital for enterprises, the return must be based upon the capital equal to the value of the plant. Referring to the
593 first of these questions, when I said that I have become familiar with the returns that were and are being made by various enterprises in the case of the securities in which my company dealt, by the word "returns" I meant largely,

as far as the bonds were concerned, the yield on the bonds. As to stocks, I meant the question of dividend paid and the relation of earnings to dividend, and the question, generally speaking, of asset value to par value, or number of shares outstanding.

594 In answer to the second question, I stated that I am familiar with the returns which are being made generally in this part of the country on investments in public utility and other businesses. I understood the word "investments" to mean the capital embraced or embarked in the public utility undertakings. I understood that word to mean all of the money which the investor would put in at the time if he were buying or building an undertaking of this kind. It is true, I am looking at the investor's equity in the business, but I am looking particularly at the total value of the property; the total that might be embraced in the value of the property in bonds, stocks, surplus, and whatever else there might be.

595 In speaking of the 8 per cent return and the 7 per cent return that the investor would require on the investment in public utility enterprises with similar risks and uncertainties as the Illinois Bell, I did not have in mind that the bondholder would require 8 per cent return and the stockholder would require 8 per cent return. I assumed that if a group of capitalists advanced or raised an amount of capital to buy the undertaking outright, then this group might subsequently issue a certain amount of bonds, and a certain amount of stock in order to finance that investment. The bonds would bear a much lesser rate than 8 per cent, and the stock earnings would be over 8 per cent, probably, under a sound and, as close as may be, a fair recapitalization.

596 I would consider the 8 per cent as 8 per cent on both the stocks and the bonds.

I had in mind what the average investor, who would put his money into that kind of enterprise, would expect. I have had in mind the return which a group of capitalists or bankers would expect in the first instance to raise the capital. They would depend more or less upon the investment market to distribute, in whole or in part, the securities after the capital

had been enlisted in the enterprise. The return that would be expected on the capital put in by the bankers would depend to some extent upon the market conditions, upon the selling resistance, and upon the type of investment that they could resell.

597 I think that there are a certain amount of bonds and a certain amount of stocks that might be issued to raise the funds, and my experience leads me to believe also that certain dividends would have to be paid on that stock, and that the earnings would have to exceed the dividend paid. In measuring the 8 per cent return, the necessity of which I have testified to, I had in mind the amounts necessary

598 to take care of the interest expected to be paid upon the bonds to be issued, and the earnings applicable to the stock. The return in relation to the requirements for interest and dividends and the margin above the dividend requirements are taken into consideration.

I have spoken of my familiarity with the Bell System, and with the fact that my Company has participated in syndicates that purchased and sold the bond issues of certain of the subsidiary companies, like the Northwestern Bell, the New York Telephone Company, the New England Telephone Company, and the Southwestern Bell, and also A. T. & T. bonds.

I have also spoken of the total amount of assets of the

599 Bell System as shown on a consolidated basis, and the total amount of the earnings of the Bell System on a consolidated basis. When I spoke of the Bell System, I thought of it as a unit of which the A. T. & T. was the head. I was speaking of the A. T. & T. owned properties and subsidiaries, consolidated. When I spoke of it in that light, I also spoke of the A. T. & T. and the subsidiary companies as a unit engaged in the telephone business proper, in the manufacturing business of the Western Electric, in the phonograph business, in the moving picture business, the telegraph business, the radio business, and, to a certain extent, in the television business.

I do not remember how much capital was attracted to the

Bell System during the period from 1923 to 1931, but I remember it was a very large amount. I do not have the exact figures before me. The figure of $1,820,000,000, of which $520,000,000 was bonds, given by counsel for defendants,
600 sounds right.

I think the Bell System securities by and large during that period were well regarded; and to a degree they got what is known as cheap money.

The Bell System has in the United States, I think, some 16,000,000 telephones, out of a total of 20,000,000 or somewhat less. I do not know how many companies operate the 4,000,000 that are outside the Bell System. There must
601 be quite a large number of such companies. There are very few companies outside of the Bell System operating in cities of 250,000 or over. I do not think of any which operate in a city over that size. Neither do I think of any in this country operating in cities of over 100,000. The only company of any size that I recall is, I think, a company called the Lincoln Telephone Company, the size of which I do not know. It is located in Lincoln, Nebraska. There are few large telephone companies outside of the Bell System. I do not think of any telephone company in this country outside of the Bell System that would require, say, $5,000,000 or $10,000,000 of capital.

602 The actual earnings of the Bell System, on a consolidated basis, on the book value of its assets, as shown on the balance sheet, varied from around 6 per cent to a rate, in 1931, of slightly over 5 per cent. The return of some of the subsidiaries on the book value was probably a little higher than this 5 or 6 per cent, but some of them were not greatly at variance. In 1931, according to the annual report of the A. T. & T. which has just been released, I think the earnings, on a consolidated basis, were only slightly
603 over 5 per cent. In 1930 they were 5.8 per cent, and in earlier years a little more, but I have not the per cent in mind.

The cost of borrowed money to a utility consists of two things: the discount in the price paid by the bankers, and the

expense incurred by the company in trustees' fees, certification fees, registration, and things of that nature. The price that a banker or underwriter pays to a company for its bonds represents the wholesale price, and the price that the
604 banker gets on resale to investors is the retail price. The banker must have a certain margin in order to cover expenses and profit, and that margin below the list or offered price to the investor is the wholesale price. He bears in mind the retail price in determining what his wholesale price is going to be.

The original offering of the bonds of the Illinois Bell Telephone Company in 1923 was about 95, to yield about 5¼ per cent. I do not know the yield-on-offering price of any other Bell Telephone security during the period 1923 to 1931.
605 Recently, I think, the Telephone Company and the telephone industry have enjoyed better credit than the railroad industry. That means that they have been able to sell their bonds at a lower yield, and they have borrowed money at lower cost than the railroad industry. I think that in the earlier years of the period 1923 to 1931, by and large, the Telephone Company securities compared very favorably with the railroad. As I recall, the railroads were returned by the Government in 1920, after Government operation, with some difficulties. In any event, I would say that the telephone industry compared favorably with the railroad. Perhaps some railroads could borrow a little more cheaply than the
606 Telephone Company, and others could not.

The Bell Telephone funded debt obligations, by and large, compared favorably with other public utilities during the period 1923 to 1931. I would say that the bonds of the Telephone Company, bearing the same coupon rate and having the same maturity, probably sold a little higher than the average of other public utilities. The yield to the investor was a little lower in the case of the Telephone Company, although the mortgage bonds of the better utilities, like the Consolidated Gas Company and its subsidiary, the New York Edison Company, would sell on just about the same level as

the mortgage bonds of some of the more important subsidiaries of the Telephone Company.

607 The A. T. & T. obligations are all debenture obligations. Most of them are not secured. If, however, you were to compare them with the debenture obligations of the electric light and power industry, or the gas industry, I should think that the rate of return produced by those obligations at the market price would be very similar to the electric light and power. I would say that the mortgage obligations of a subsidiary of the Bell System, like the Illinois Bell Telephone Company, would compare favorably with the mortgage obligations of the gas and electric light utilities; the yield would be very similar to the better obligations.

There are probably 20 or 25 of the better grade gas and electric companies that issue credit obligations in excess of $5,000,000.

608 There are, relatively speaking, a small percentage of companies in the gas and electric light industry that issued securities during the period 1923 to 1931 which had funded debt obligations of $5,000,000 or over, and those I would consider to be the high-grade companies which I compare with the Illinois Bell for relative yields. I do not
609 have the figures showing the total amount of money acquired by gas and electric utilities through credit obligations during the period 1923 to 1931. I do not know what percentage of the total amount of money acquired through the sale of credit obligations was acquired on the same basis of offering yield approximating that of the Illinois Bell. I would say not a very large percentage. It would be less than 50 per cent, but I am not sure that it would be less than 25 per cent.

Assuming that market conditions are the same and that bonds are issued by various companies, the ratio of earnings to bond interest is very important in the determination of the difference in the yield to investors of the various classes of bond issues. The record of the company over a period of

time is important; the ratio of indebtedness to assets is
610 important; the character of the business and the management of the company are important. Those, I think, are the primary things.

I only know the ratio of funded debt to capitalization in the Bell System on a consolidated basis. The Illinois Bell Telephone Company has outstanding slightly under $50,000,000 of bonds and about $150,000,000 of stock. The entire Bell System has a bonded indebtedness of about $1,000,000,000. The capitalization of the entire System on a consolidated basis is somewhat over $2,000,000,000. The total of bonds and
611 stocks outstanding on a consolidated basis is approximately $3,250,000,000. The $1,000,000,000 outstanding funded debt includes the funded debt of the subsidiary companies and the A. T. & T. These figures which I have just mentioned were as of 1931 and based upon the 1931 annual report. The proportion of bonds to total capitalization has come down over the period 1923 to 1931; there were more bonds and less stock earlier in the period. That would
612 be very helpful in improving the credit of the Company.

The total assets of the Bell System on a consolidated basis in 1931 are about $5,000,000,000 and the funded debt is about $1,000,000,000. The relationship between funded debt and total assets has also improved during the period between 1923 and 1931, which was helpful in keeping up and improving the credit of the System.

The capital stock of the Illinois Bell Telephone Company has increased materially since 1923. There has been no increase in bonded debt, so the ratio has been improving from a securities and credit standpoint. That has the same
613 salutory effect upon the credit of the Company; it is healthy. The total assets of the Illinois Bell at the present time are about $320,000,000, and outstanding stocks and bonds of $200,000,000, as shown by the books, and that has grown during this period from 1923 to 1931, inclusive.

The Chicago property of the Illinois Bell, I think, is approximately two-thirds of the property of the Company. I did not have in mind that the ratio of outstanding obligations

for the Chicago property would be in about the same proportion as the total outstanding obligations of the entire Company. I do not know how they would allocate a part of the outstanding capitalization to a part of the property, but I understand that the book value of the assets of the Com-
614 pany in Chicago is about two-thirds of the total and I assumed it to be that throughout.

In my opinion, those companies whose bonds sell to the investor at an offering price to yield, say, 5.5 per cent, compete to some extent for the capital of the investor against a bond selling on a yield-on-offering price of 6.5 to 7 per cent. But the bonds on the basis of 5.5 per cent look to a rather different class of investors than those of the corporation that has to pay 6.5 per cent for its money. To a considerable extent, the type of investor to be attracted by bonds sold to yield 5 or 5.5 per cent will be different from that attracted by bonds sold to yield 6.5 to 7 per cent. With the variation in the
615 retail price of the bonds, the banker takes into account the selling resistance in determining the wholesale price. It is usually more expensive to sell a speculative type of bond, I think, than to sell a high-grade issue. There is some
616 relation between the type of issue and the discount or annual charge. I can tell about what the maximum spread was between the retail and wholesale price of Bell Telephone bonds during the period 1923 to 1930. It varied from 4 to 3¼ per cent. This, translated into annual charge, was probably a quarter to .3 of 1 per cent. The spread in the case of gas and electric companies was very similar, some running somewhat higher and some somewhat lower; that is, there was a greater spread, although not as high as a per cent greater, unless it was a case of a very short obligation. I have been talking of high-grade securities, but it is very unlikely that there would be a spread as high as 1 per cent in the case of speculative obligations. In connection with high-grade
617 securities, I should say that .4 of 1 per cent would be the maximum spread on the basis of annual charge. It might possibly be one-half of 1 per cent.

I would consider from 5¼ to 5¾ per cent to be a fair yield

to the investor on offering price of these high-grade bonds during this period. The corresponding yield on medium-grade bonds during this period, I should say, would be from 5.5 to 6.5 per cent; on speculative bonds, from 6.5 per cent to 8 per cent, perhaps.

618 I did not assume that any of these public utilities were financed on a speculative basis from a bond standpoint. I assumed that all of the borrowed money would be on high-grade securities. In speaking of the gas and electric companies, I had in mind fairly sizeable and relatively strong companies.

619 When I spoke of the investor and what the investor would expect, I had in mind the ordinary investor. What the ordinary investor expects when he buys a bond depends on the type of bond. The ordinary investor would buy an ordinary type of bond. He expects, when he purchases a bond, to get his interest as stipulated; he expects to get his money back on a definite maturity date as stipulated in his bond; and he would expect to get whatever additional money the company agreed to pay if his bond were retired in advance of maturity. He would also expect to get priority
620 in the distribution of assets upon dissolution or distribution of assets, or in the case of bankruptcy.

The investor who puts his money in stock expects to get the dividends declared by the directors; he has an equity in the undivided profits. Upon dissolution or liquidation, he expects to get his proportionate share of the total assets remaining after taking care of all prior claims. He also expects to participate in the management of the corporation to the extent to which he has the right to vote or participate.

621 It would not make much difference to the stockholder, provided he received a return which was acceptable to him, that the company in which he made his investment would use its own employees, without charge to the investor, to help the investor sell his own securities in order to raise the money to subscribe to the stock or bonds of the company in which he makes his investment.

"Q. He would not expect the company to help him raise the money to subscribe for the stock, would he?

"A. He would not expect the company?

"Q. Yes, to help him raise the money to subscribe for the stock in that company.

622 "A. He, the stockholder—

"Q. Yes.

"A. —would not expect the company to help him, the stockholder?

"Q. Yes, raise the money in order to subscribe for that stock; that is his own affair, is it not, to raise the money?

"A. Yes.

"Q. I beg your pardon?

"A. Yes. The company might make it helpful by issuing information, or what-not."

The question of a corporation investing in a subsidiary corporation, expecting the subsidiary to use its employees, at its own expense, to assist the stockholding company to sell its own securities is one of management; I cannot answer
623 that very well. There might perhaps be advantages to the stockholder of the subsidiary company to have the securities of the parent company distributed in its territory.

Q. Let us take Company A and Company B. Company B is about to purchase stock in Company A, and desires to get the necessary money in order to purchase that stock. Company B has Company A use the A Company's employees to sell bonds of the B Company, to raise money to permit the B Company to purchase stock of the A Company. Now, if B were the ordinary investor, would it expect A to help it raise the money to purchase that stock?

624 "A. Well now, if you carry that through to your logical conclusion, then B is the only stockholder in A.

"Q. Well, whether it is the only stockholder or a large stockholder, it makes no difference, it is immaterial.

"A. So that if A spent some money for the benefit of B, it would be spending it for the benefit of the principal stockholder?

"Q. That is right.

"A. Well, why not?"

The ordinary investor does not, I should say, expect the corporation of whose shares he expects to make a purchase, to raise the money so that he, the investor, can buy shares in the corporation.

"Q. Yes, sir. Now, similarly, would that same investor expect the company in which he makes the investment to defray any of the expenses incurred by the investor himself, in raising the money to make the investment?

"Mr. Blackman: I object to that as not proper cross examination.

"Mr. Goldstein: I am testing what he considers the ordinary investment.

625 "Judge Wilkerson: Well, I will allow a liberal cross-examination on both sides. He may answer.

"A. The ordinary investor, I would think, would not expect that.

"Mr. Goldstein: Now, in thinking of the ordinary investor, and in making the ordinary investment, did you consider that the company in which the investment was made, was a component part of a large system to which the benefits of the company's operations accrued, and the stock in the system companies was all owned by the same investor?

"A. I was considering the matter with reference to the Illinois Bell Telephone Company, as though it were an in-
626 dependent entity.

"Q. Did you consider in your determination of what the ordinary investor would expect, or what you would consider that the ordinary investor would expect, that the company in which he owns the investment in stock would perform without charge whatever services were necessary to permit the employees of the company to purchase stock of the investor on the installment plan?

"A. He probably would not give—the investor would not give a detail of management of that kind very much consideration.

"Q. He would not expect to have that done for nothing, would he?

"A. Well, on the statement as you have made it, I would think not."

In determining what return the average investor would expect of the Illinois Bell, I did not give consideration to the fact that the Company's employees and the employees of other companies in the Bell System are all joined under a plan where the investor, the A. T. & T. Co., can shift employees around from one organization to another as the investor sees fit.

627 By the Court:

It is not my contention, nor did I advance the idea here that in arriving at a conclusion as to what is a fair return upon money devoted to the public use, the Court is to arrive at any different conclusion because it happens to be the money of one company rather than another. The test is what is a fair return upon money devoted to public use; and it makes no difference whose money it is, nor what the capitalization is, nor whether it is the money of the Standard Oil Company or of any one else.

"Judge Wilkerson: I just wanted to make sure in my own mind whether, in arriving at his conclusion as to what, in his opinion as an expert, the fair return upon this money

628 that is devoted to the public use is, he has given any consideration to the fact that the money which was devoted to the public use was my money, we will say, or the money of the American Telephone & Telegraph Company, rather than the money of some other company.

"Mr. Goldstein: And did not take into account the relation between the investor and the company in which the investment is made.

"Judge Wilkerson: As to what is the test, what are the elements properly to be considered, I suppose the Court would have to decide that, when the Court arrives at a conclusion as to what is the fair return upon money devoted to the public use. And I was wondering whether there was any contention here that it made any difference whose money it was.

629 "Mr. Blackman: So far as we are concerned, we make no such contention. And, following up your Honor's

contention, I would like to point out that in my questions I did not ask what the fair return was. I followed the language of the Supreme Court in the Bluefield case, and asked this witness what rate of return this Company would have to earn in order to earn the same return that was being made by other companies at this time in this part of the world, subject to the same risks and uncertainties.

"Mr. Goldstein: But you did not ask him any questions required by the Smith case, in the decision of the Court.

"Did you take into account in determining what your ordinary investor would require, the return that he expected, and, in thinking of the Illinois Bell and its relation to that ordinary investor, the fact that this Company was required to make a detailed statement each year, and for a period of years, in advance of its requirements for the purchase of supplies and materials, and furnish those statements to the investor, to be used by the manufacturing company of
630 those supplies and materials in which the investor also owns the stock?

"A. I assumed the Company would have efficient management, and that whatever policy efficient management dictated, would be followed. I did not think of the detail of filing in advance—

"Q. Statements?

"A. —schedules of this kind."

I assumed that the management would file detailed statements with its own Board of Directors. As far as the investor represented control of the Company, he would, through his officers or the Board of Directors, determine the amount of extensions, or additions, and the purchases of the
631 Company. It would be the owners acting through their representatives that would determine that. It would be the owner, whether it was the average investor, or what-not. The stockholders elect the directors, and the directors represent the stockholders. It is through the election of the directors that the ordinary stockholder would control the corporation.

I did not take into account the fact that the investor, as

such, apart from the Board of Directors, would specify who should be the seller of apparatus purchased by the Company in which he made his investment. I did not take into account that the investor, as such, apart from the Board of Directors, would specify who the manufacturer of the apparatus should be.

632 "Q. Did you take into account the fact that the company in which the investor made his investment is required to share the expense of research which is undertaken by the investor himself, so that any new discoveries that are made in the business would be woven into the plant in which he has his investment?

"A. Not unless the Board of Directors should determine that such a policy was in the interests of the local company.

"Q. Yes. It would be—pardon me?

"A. In other words, to get value received for that expenditure.

"Q. It would be treated as a separate item?

"A. Yes, sir.

"Q. And would you take into account the fact that, if the investor were to undertake the research himself apart from the Board of Directors, and should in the course of that research come upon inventions that were applicable to fields other than the field of operation of the company, the investor could keep all of the profits of those outside activities without accounting to the company?

"A. I did not take that fact into consideration."

In answering the above questions about the Illinois Bell, I assumed that the Illinois Bell was operating as a separate
633 unit and would raise its money as a separate unit in relation to the public. I did not assume that the Illinois Bell was a component part of a system, headed by one company, which raised the capital for all the component parts of the system, at their expense, by the issue of one well and nationally known security as the source of funds for all.

I stated in the course of my direct examination that investments in the telephone business are attended with certain risks and uncertainties. The Telephone Company is

limited, as far as its profits are concerned, by reason of regulation. There is a hazard in connection with the telephone business by reason of the fact that if at any time, on account of increased operating expenses, or for other causes, the return becomes inadequate, the procedure of obtain-
634 ing relief is usually drawn out for a number of years and during this period of inadequate rates the company suffers a certain loss, which is gone forever because the regulatory body or the courts, in afterwards adjusting the rates, do not make allowances which will permit the company to make up the loss incurred during a period of litigation.

635 The Telephone Company suffers (or makes an unfavorable comparison with respect to other public utilities, particularly electric and gas companies), because the investment per station in the telephone business tends to increase, and, as the overhead represented by that investment is one of the principal items of true cost of service, to that extent the cost per station goes up, and the return becomes less. The Telephone Company is also at a disadvantage by reason of the fact that, in the event of declining business, it has less flexibility in adjusting its operations.

636 I think that, in the development of its business during the past few years, the Telephone Company has reached a clientele of more moderate circumstances than the average subscribers of a few years ago. Therefore, in a business depression, the Company is more vulnerable on account of the danger of losing subscribers than it was in the earlier period. An investor would take that into account.

Some investors think that the development of wireless communication offers something of a threat to investments in telephone communication by wire. The investor in a
637 telephone utility might also fear that the use of the reproduction cost basis for rate-making purposes would reduce the rate base in part, and, therefore, reduce his dividend payments.

In giving my opinion as to the necessity of earning 8 per cent or 7 per cent on the value of the property of the Illinois Bell Telephone Company, I was taking into consideration the risks.

The resale price of bonds is not a complete criterion of the price at which the company would have to sell its bonds to attract capital; it has some significance, depending upon conditions. But if a similar bond sells occasionally at a cer-
638 tain price, it means that a large issue of $50,000,000 or $100,000,000 can probably be floated a few points below that price. It is impossible to generalize completely upon that. The resale price of securities of the company has some relation to the opinion of the investors, and the degree of stability of the business. The price at which the securities sell provides some indication of how the investor regards that company.

I would expect the risks which I mentioned, and particularly those which would affect the telephone companies in times of depression, to be reflected in the prices of telephone securities during a period of depression. I think the Illinois Bell bonds have had a favorable market during practically all of the period 1923 to 1931, as compared with the resale yield of gas and electric companies' securities.

639 In defining the period of depression, I think the present and prospective situation must be taken into consideration. When I say "present," I mean today and I would go back as far as the beginning or the middle of 1930.

The resale prices of Bell System credit obligations have compared very favorably with the resale prices of rail-
640 road credit obligations.

By the Court:

There are $5,000,000,000 behind Bell System bonds. The amount of the bonds is $1,000,000,000. There are five to one, approximately, back of the bonds. It would be impossible to raise the $5,000,000,000 on bonds alone.

641 "Mr. Goldstein: The witness says the original sale price would be affected by certain risks, and he says the same risks would likewise affect them on resale."

I did not say that the resale prices of credit obligations of the Company would be affected by certain risks; that would only happen to a small extent; the total investment would be affected.

"Judge Wilkerson: I do not believe anybody in the world would contend that you ever had a company that could raise all of the money it had to have to acquire the property devoted to public service, by issuing bonds against all of the property at 5 per cent.

642 "Mr. Goldstein: No, but the amount that the investor would expect to get out of the balance of the capital would depend upon the character of the credit obligations as well, and the interest rate.

"Judge Wilkerson: Of course, you have the stock, but that is speculative.

"Mr. Goldstein: Yes, but the degree of speculation would depend upon the character of the industry, the character of the company, which is determined likewise in the sale of the bonds.

"Judge Wilkerson: Well, experience is a pretty good teacher with respect to that, is it not?

"Mr. Goldstein: I am just testing the witness as to what he knows about the experience on this point—which we will show."

I spoke of an 8 or 7 per cent return on the value of the property devoted to public use during the years 1923 to 1931. Assuming a sound capitalization, the amount of dollars resulting from such a return, and the amount of dollars
643 necessary to pay the interest and dividends, and have a margin for surplus, would be similar. If I were to assume that the Company in this case stated a fair value of the property which it employed for the convenience of the public in Chicago as X dollars in the years 1923 to 1931, inclusive, I would consider very inadequate a return on that value equal to 3 per cent, but which took care of all expenses, the interest, and amortization of the bonds, and yielded $9 per share for every $100 of investors' money in the capital stock. I would think further that, for some reason, the capitalization had been very much less than the X dollars of the assumption. If it were otherwise, the 3 per cent on the X dollars would not pay the interest and dividends
644 stated. If you have $100,000,000 of capitalization and $300,000,000 of property, of course, a very small return

on the $300,000,000 would provide a very substantial return upon the $100,000,000.

If I found as a result of the small ratio of outstanding bonds and stocks that a small return on the property was
645 sufficient to pay $9 per share for every $100 invested, I would think that the $9 to $10 a share would mean that those shares were very good. On that kind of showing, the Company probably would be able, under efficient and economical management, to maintain and support its credit, and it would probably be possible to raise the money necessary for the proper discharge of its public duties. If the return on the value of the property was $11 per share, or more than $10, it would probably be more than sufficient.

In speaking of electric and gas companies, I particularly referred to the electric power industry; I would include in my electric companies the light and power companies.

646 Speaking of the hazards of the telephone business, I stated that if the courts were to give reproduction value weight in determining the rate basis, the investment might suffer as to that part of the plant constructed during the period of higher costs than those which may be experienced in the future, if the decline in construction costs, some of which we are experiencing now, continues. The period of high
647 construction costs would include 1923. If the entire plant were valued on the basis of unit costs prevailing during any of the years from 1923 to 1930, when prices were high, I should say that the hazards were increased.

The ordinary investor might have expected at the time that the prices prevailing in the years 1923 to 1930 would be likely to prevail for a reasonable period in the immediate future. Recent experiences have now called the question into doubt; since the beginning of 1930, developments, I think, have begun to bring the question before the minds of investors, but not before that.

By the Court:

Of course, there has always been some debate on that subject, and a very sharp debate on that point, even during

1928 and 1929. Of course, during a part of those years,
648 the companies believed, as many investors believed, that that part of the plant constructed prior to the outbreak of the World War, and still in service, had a value in excess of the book value, because the duplication value was greater than the cost.

By Mr. Goldstein:

That was judged by the spot prices of the year which they were thinking about.

By the Court:

I have testified on the rate of return, in a number of utility cases during the period in question here, and have given the matter a great deal of thought. I came to the conclusion, in the light of the information available to me in those years, that the return to which I have testified would have been necessary in those years. I have put out of my mind,
649 in giving these rates, the economic experience since the Supreme Court wrote the opinion in this case, and have endeavored to state these rates upon the facts as they existed at the respective dates.

Re-direct Examination by Mr. Blackman.

650 I do not know that I can give the approximate dates of the cases in which I have testified, but during the period from 1921 until, I think, 1927, I testified in connection with the rate of return in two cases involving the Consolidated Gas Company. I testified before the New York Commission in two cases involving the New York Edison Company. I testified before the Commission, and later before the Master, in connection with a case involving the New York Telephone Company. I testified in Baltimore before the Commission in one case involving the United Railway & Electric Company, and in another case involving the Consolidated Gas, Electric & Power Company of Baltimore. I have also testified in some smaller cases during that period. That covered pretty well the period from 1921 to 1927.

At those times I prophesied generally the same things

which I have prophesied today, and used the same rates
651 of return generally. The last case prior to this one in which I testified was, I think, the New York Telephone case, in 1927, when I believed that an 8 per cent return was necessary.

Now, in 1928, 1929 and 1930, it seems to me that confidence was pretty general in this country. The supply of capital was relatively large, and therefore it probably would have been possible to finance public utilities during these years on a 7 per cent basis instead of 8. It is a very close question, however.

I have testified to an 8 per cent return in all these other cases that I have referred to. Several of these cases went to the Supreme Court of the United States. I testified to an 8 per cent return, and the 8 per cent was, I think, the rate sustained very largely.

When I made a comparison of the hazards of the telephone business with those of gas and electric companies, it was after having studied those companies, and being familiar with them, and having testified for them as to the proper rate of return in those industries.

652 One of the advertisements to which my Company's name was signed, shown to me on cross-examination, was Defendants' Deposition Exhibit 106. This sets forth a relatively recent offering of the American Telephone and Telegraph Company, 35-year, 5 Per Cent Gold Debentures, amounting to $150,000,000, and offered to the public February 1, 1930, at a price of 99½. The last column to the right (those figures appearing in the center of the page of this exhibit), reports or summarizes the net earnings of the American Telephone and Telegraph Company available for interest. It shows that the interest charges were earned, during the years hereafter stated, the following number of times: 1924,
653 6.4; 1925, 5.9; 1926, 6.3; 1927, 6.9; and 1928, 7.4. That, plus the other information available to the average investor, showed that he could purchase bonds of the American Telephone and Telegraph Company with very little risk.
654 That risk was small because the indebtedness bears such a very moderate proportion to the property value and to the

capitalization as a whole; that is, the $1,000,000,000 of bonds I have referred to, compared with the $5,000,000,000 of book assets, which is about 20 per cent.

The American Telephone and Telegraph Company itself, during this period, showed a ratio of bonds to total assets of as low as 15 per cent.

655 I have seen a booklet or circular of the Bell Securities Company, a subsidiary of the American Telephone and Telegraph Company, issued some years ago, in which the statement appeared that the actual value of the properties of the Company was far in excess of the book value. By and large, I think that statements of that kind by the American Telephone and Telegraph Company and the Bell Securities Company are regarded by bankers and investors as being reliable.

When I said that the bonds of the Bell System compared favorably with bonds of gas companies, I had in mind the fact that the bond interest was earned from 5.9 to 7.4 times in the case of the securities of the Bell System, and that the bonded debt of the Bell System, as compared with the earnings and property value, was very moderate. I do not know of any gas company or electric company of first rank that has a bonded indebtedness quite as low as that of the

656 Bell System. Some of them are approximately as low.

The bonded indebtedness of a large, conservative gas or electric Company runs from 30 to 40 per cent of the property value. It is rather questionable whether a public utility could maintain its credit if it permitted its borrowings to exceed materially 30 to 40 per cent of the property value.

In considering the rate of return for the Illinois Bell Telephone Company, I considered that Company as an independent entity, because I have had to assume that this business is to attract the capital necessary to reproduce it, and what the expectations would be. If we obtained the capital from a group of investors, the Company would have to be disconnected from the Bell System in order to give an indica-

657 tion as to what capital would be expected; that is, if the Illinois Bell were to appeal to the public for funds, and

were to raise any great part of its money on stock, it would have to be pretty completely divorced from the Bell System, because as long as the American Telephone and Telegraph Company was a substantial stockholder in the Illinois Bell Telephone Company, the Illinois Bell would have no financial worries, and its securities would sell on a very high basis, perhaps, which would not give an indication of what
658 the investor in a public utility enterprise would expect if it were on an independent basis.

I have stated that, in my opinion, a telephone company, such as the American Telephone and Telegraph Company, doing a nation-wide business, should earn on the value of the property which it employs for the convenience of the public, in order that such return shall equal that being generally paid at this time in this country on investments in other business undertakings which are attended by corresponding risks and uncertainties, in excess of 8 per cent. The percentages necessary, in my opinion, in the years prior to 1932 would be: in the latter part of 1931, 8 per cent; in the earlier part, 7 per cent; 1930, 7 per cent; 1929, 7 per cent; 1928, 7 per cent; 1927, 8 per cent; 1926, 8 per cent; 1925, 8 per cent; 1924, 8 per cent; 1923, 8 per cent.

It is my opinion that, no matter how the money was obtained, whether by the Illinois Bell Telephone Company itself or through the American Telephone and Telegraph Company, the return would have to be the rates which I have stated on the fair value of the property in each of the various years.

659 It would make no difference, in my opinion, in that respect, if we took into account that the Illinois Bell Telephone Company was a part of a large system organized for the purposes of maintaining the credit of the constituent companies; and securing their efficient and economical management.

Re-cross Examination by Mr. Goldstein.

The A. T. & T. bond issue of which I spoke is a debenture bond issue. A debenture bond issue ordinarily has no specific security behind it. There are other types of bond issues, such as a bond issue of the Illinois Bell Telephone Com
660 pany secured by a lien on fixed assets. There is occasionally a bond issue secured by a lien on stocks, and also bond issues which are debenture issues having convertible features. The mortgage bonds of a company usually sell at a more favorable price, and on a lower interest basis than the unsecured obligations. The investor probably would not expect to have the same margin of earnings to interest in the case of a fixed lien bond as he would in the case of a debenture bond, although whether the bonded debt is secured by lien or not, if it exceeds a certain proportion of the capitalization or property value, the bonds will lose their
661 credit standing. I would expect a high-grade debenture bond issue to have a greater number of times interest earning capacity than I would a mortgage bond.

The case of the United Railway & Electric Company of Baltimore, in which I testified, was the case that went to the United States Supreme Court, known as the Baltimore Railway case. I cannot recall the year of that case, and am not confident it was the same case in which I testified before the Commission which afterwards went up to the Supreme Court, but I did testify in connection with a case of the Company before the Maryland Commission. I think the case decided by the Supreme Court grew out of the same proceedings
662 that I testified in originally, but I am not confident. The Consolidated Gas case in which I testified went to the United States Supreme Court. I believe I testified in regard to the 85 Cent Gas Case and also in regard to the so-called "Dollar Gas Case." I do not think I testified in any other case that went to the United States Supreme Court. The only case in which I testified that I positively know went to the Supreme Court is the Consolidated Gas case, and perhaps the Baltimore Railway case.

I cannot recall exactly what I testified to in the Baltimore case, but I think I testified at that time that an investor in a company similar to that would expect to have, in order to attract capital, a return in excess of 8 per cent.

663 "Mr. Haight: I would like to place on the record, if your Honor please, a motion to strike all of the testimony of this witness on the ground it appears, both upon his direct and upon his cross-examination, that he was giving opinions in respect to the Illinois Bell Telephone Company as an ordinary public utility, and that showing upon both direct and cross-examination is not in any wise helped by the last question asked by counsel for the plaintiff on re-direct examination, in which he quoted a part of a sentence from the opinion of the Supreme Court, that part being this: 'one that is part of a large system organized for the purpose of maintaining the credit of the constituent companies and securing their efficient and economical management.'

"The inclusion of that part of the sentence of the Supreme Court's opinion, and getting the answer from this witness that in the witness' opinion that would make no difference to him whatever, he would give the same answers in respect to such situation as he would in regard to the ordinary public utility, separate, and in the usual situation—

"The Court: I did not so understand the testimony. I
664 thought what he testified was, in his opinion the Illinois Bell Company was just as good as the American Telephone and Telegraph Company when it came to raising money. Sometimes the big company is worse than the little one.

"Mr. Blackman: Not the same amounts, of course, but the same relative amounts.

"The Court: Sometimes the little company's credit is better than the big one's.

"Mr. Haight: The entire sentence in the opinion is this: 'It is evident that in the present case we are not dealing with an ordinary public utility company, but with one that is

part of a large system organized for the purpose of maintaining the credit of the constituent companies and securing their efficient and economical management.'

"Whatever he meant by the answer to the last question on re-direct examination, the motion to strike is just the same.

"The Court: Have you anything to add to that? Did you consider the fact that practically all of the stock of the Illinois Bell Telephone Company is owned by the American Telephone and Telegraph Company, and that as a result, 665 the Illinois Bell Telephone Company is one of the units in this vast system?

"A. I assumed that you could enlist capital necessary for this purpose for a telephone company in this district, independent of the A. T. & T.; and one which was efficiently managed.

"The Court: The motion of counsel will be noted on the record. I would not care to pass on that without consultation with the entire Court. The ruling will be reserved until the case is argued before the entire Court."

Re direct Examination by Mr. Blackman.

"Q. Mr. Hoyt, if we assume that the Illinois Bell Telephone Company is a part of a large system, organized for the purpose of maintaining the credit of the constituent companies and securing their efficient and economical management, and that there is a parent company which fur- 666 nishes funds, or the greater part of the funds for these companies for their expansion, it would be necessary to take into account, viewing the rate of return on that basis, what it would cost the parent company, would it not?

"Mr. Haight: I object to the question because the assumption made in the question omits very many of the inherencies of the relationship between the A. T. & T. and the plaintiff in this case.

"The Court: He may answer.

"A. If the requirements of the Illinois Bell were to be financed by the A. T. & T., of course, that fact would have to be taken into consideration."

If the Illinois Bell and all the other 24 subsidiary companies of the Bell System were to be financed by the A. T. & T., and I wanted to know what it cost to do that financing, then I would have to know at what price the American Telephone and Telegraph Company financed its entire requirements, based on the entire value of its property.

It was with that in view that I made the statements
667 that I did as to the rate of return, or the percentages for the years 1923 to 1932, inclusive. I also had in mind, as far as the Illinois Bell is concerned, the rate of return which would be necessary to enlist the capital in that corporation, whether an individual or a corporate stockholder. That return would have to be expected; that would have to be the expectation.

"Mr. Haight: We renew the motion to strike. The only purpose of renewing the motion is that it may include the testimony of the witness on re-redirect.

"The Court: Ruling reserved."

668 L. R. MAPES, a witness on behalf of the plaintiff, having been previously duly sworn, resumed the stand for cross-examination and testified further as follows:

Cross-Examination by Mr. Haight.

Those exhibits introduced by me (Exhibits A-39 to A-47, both inclusive), which make separations by years from 1923 to 1931, inclusive, were based upon studies for each year
669 separately. The reproduction cost new figures in Exhibits A-41 and A-43 were taken from Mr. Sloan's figures. Exhibits A-42 and A-44 are based upon Mr. Redmund's exhibits, the final summary of which was Plaintiff's Exhibit A-22. Save for that, these exhibits which relate to various years, 1923 to 1931, inclusive, are based upon a separate inquiry respecting each year.

I mean by "normal requirements", the inclusion of provisions for reasonable extensions. The reasons for such

provisions are so that we can give proper telephone ser-
670 vice. We have some margin of telephone plant so that we can give a subscriber either new or additional service promptly.

"Q. That is, if you have more conduit than you immediately need, you have more switchboard provision than you immediately need, you have provision more than you immediately need, within reasonable limitations, those are to prevent inadequacy in respect to any of those things?

"A. I would not express it in those terms.

"Q. How would you express it?

"A. I would say it was so we could give telephone service."

I don't think I consider the word "inadequacy" in my ordinary engineering work. I cannot give a definition of that word. I have heard the term used in connection with depreciation. I might try to express what I mean as inadequacy, or as I understand it as used in depreciation matters. For
671 example, we might have a switchboard located in a building which could not be extended. Because of the impossibility of extension it might be necessary to build a new building and replace that switchboard, in which case I would say that the old building and switchboard had become inadequate. If we had some spare building capacity in that particular building, as I see it, it would not become inadequate until that spare capacity had been used up. We generally make provision for reasonable growth of the plant. But there
672 comes a time when we can no longer make that provision in a specific location.

Re-direct Examination by Mr. Thompson.

Exhibits A-41, A-42, A-43 and A-44 (in which I have made certain apportionments of reproduction cost new, and reproduction cost new depreciated, of the property of the plaintiff Company in its Chicago area), contain not only the dollar figures of the apportionment, but also percentages which, when applied either to reproduction cost new or reproduction cost new depreciated, will give a separation or apportionment of plaintiff's property on the basis of use.

H. A. HARRIS, called as a witness on behalf of the plaintiff, having been first duly sworn, was examined and testified as follows:

Direct Examination by Mr. Thompson.

673 My name is H. A. Harris. I am in the employ of the plaintiff in this case, the Illinois Bell Telephone Company, as Plant Extension Engineer of the State area. I was a witness on the former trial of this case, when I testified as to a separation of the Company's property as of June 30, 1923, in its Chicago area, between its intrastate and its interstate uses. Since my former testimony in this cause, I have retained my position as Plant Extension Engineer up to the present time. I am familiar with the property of the plaintiff Company employed in its Chicago area in the service of the public for telephone purposes.

I undertook with Mr. Mapes, who has just testified, the preparation of exhibits showing the separation and
674 apportionment of the Company's property on the station-to-station method, as between its intrastate and interstate uses. This work was commenced January 11, 1931, and I have been engaged continuously in that work since that time.

"Mr. Thompson: I don't believe the record yet shows the introduction of Mr. Mapes' exhibits, and I would like now to offer Exhibits A-39 to A-47, both inclusive.

"Mr. Haight: I object to those that were identified by Mr. Mapes on his cross-examination as having employed exhibits of Mr. Sloan on valuation, and to those that employed Exhibit A-22 on the per cent condition, for the reasons urged in respect to the original exhibits. I merely want to preserve that.

"The Court: I think it goes to their weight rather than their admissibility, and I will overrule the objection."

(Whereupon said documents were received in evidence and marked Plaintiff's Exhibits A-39 to A-47, both inclusive.)

675 I am familiar with the exhibits which were introduced in evidence at the conclusion of Mr. Mapes' testimony,

showing the separation of the Company's property, the methods employed in the separation, the application of those methods to obtain the percentage of intrastate and interstate uses, the dollar separations made, and the apportionment of operators' wages and transmission power expense. I worked in conjunction with Mr. Mapes during the entire progress of this matter, and am familiar with all the details of the work which was done, and which are reflected in these exhibits. By the methods which were used, as they are set out in Exhibit A-40, we have separated and apportioned the entire property of the Illinois Bell Telephone Company in its Chicago area on the basis of the actual uses to which that property was put, viz., intrastate and interstate uses, in each of the years 676 included in the exhibit. In my opinion, the methods which have been used are proper and accurate ones to accomplish that purpose. When the percentages of the respective uses for intrastate and interstate, which were obtained for each of the years 1923 to 1931, are applied to the fair value of the property, as it shall be finally fixed by this Court, the resultant dollars, in my opinion, will give the value of the intrastate and interstate property of the plaintiff in its Chicago area on the basis of use.

Cross-Examination by Mr. Haight.

In these exhibits, by the term "plant", I mean the 677 entire plant in the Chicago area. By the use of the plant, I mean its use for the various services: exchange, interstate toll or intrastate toll. By "exclusive use", I mean if there was any part used exclusively for toll, that would be exclusive toll use, and exclusive local use would be 100 per cent local. By "joint use", I mean such plant as the local central office equipment, subscribers' lines and stations, which may be used jointly for local service, intrastate toll service or interstate toll service. It is not possible, of course, in respect to a jointly used facility, while it is being put to use for one class of service, to be also used at the same time in another class of service. The jointly used facilities are not

used separately and indiscriminately for each of the
678 various classes of service. They are used one time for toll service and another time for local service, but, taken as a whole, it is considered as jointly used service. Many of these jointly used facilities are used indiscriminately for toll service, long distance service, and local exchange service.

If one goes to a telephone at a private station, in his office or home or in a booth, he may call and receive intrastate
679 service, interstate service, local exchange service, indiscriminately. Those facilities, beginning with the station apparatus itself, are available at all times for any one of those services when they are not already in use for some one of those services.

680 W. K. KRUSE, called as a witness on behalf of the plaintiff, having been first duly sworn, was examined and testified as follows:

Direct Examination by Mr. Thompson.

My name is W. K. Kruse and I reside in Chicago, Illinois. I am employed by the Illinois Bell Telephone Company as General Accountant, which position I have held since July 1, 1930. I first entered the employ of the Company in 1912. I
681 was engaged in various clerical positions until 1920, when I became Special Accountant. In 1923 I was appointed Supervisor of Methods in the Accounting Department, and on March 1, 1927, I was appointed Assistant to the General Auditor. On July 1, 1930, I was appointed to my present position as General Accountant.

I am familiar with the books and accounting records of the Illinois Bell Telephone Company, particularly those which show the revenues and expenses of the plaintiff in its Chicago area. I have had supervision of the general books of the Company since July 1, 1930. Prior to that time, I had access to, and am generally familiar with, the records.

The books and accounting records of the Illinois Bell Telephone Company are now kept and have been kept during the

entire period in controversy in this cause, that is from 1923 to this day, in accordance with the Uniform System of Accounts for Telephone Companies prescribed by the Interstate Commerce Commission, and in accordance with the rules prescribed by the Illinois Commerce Commission. During this entire period, separate books and accounting records
682 have been maintained by the plaintiff Company, showing its revenues and expenses in the City of Chicago, sometimes called the Chicago area, or the Chicago exchange. That has been the fact continuously since regulation started in 1913.

The Illinois Commerce Commission has adopted the Uniform System of Accounts for Telephone Companies prescribed by the Interstate Commerce Commission. Neither the Uniform System of Accounts of the Interstate Commerce Commission applicable to telephone companies, nor any rule of the Illinois Commerce Commission, requires that either the revenues or expenses of the Illinois Bell Telephone Company be separated or apportioned as between its intrastate or interstate uses.

I have made a separation and apportionment of the revenues and expenses of the Illinois Bell Telephone Company in its Chicago area for each of the years 1923 to 1931, to
683 show separately the revenues and expenses attributable to its exchange, its intrastate and its interstate toll business. I commenced this work in January, 1931. I was continuously engaged in the separation of the years 1923 to 1930 up to the latter part of July of 1931. Afterwards I undertook, at the request of the Company, to make a separation of its revenues and expenses in its Chicago area for the year 1931. I began the preliminary work for that separation in the middle of December, 1931, although the actual results for the year were not available until after the close of the year. The work was completed and placed in exhibit form in the early part of February, and, I think, was delivered to the City
684 on the 8th of February, 1932. My earlier separation exhibits were delivered to representatives of the City

about August 1, 1931, with the exception of a few exhibits which were delivered about a week or ten days later.

I had at times as many as 25 people engaged in working on the separation for the years 1923 to 1930. I believe a fair average for the entire period would be from 10 to 12 persons. The work in connection with the separation of the Company's revenues and expenses was done in conjunction with the work which has been done and testified to by Mr. Mapes and Mr. Harris, in separating the property of the Company as between its intrastate and its interstate uses.

There are certain revenues and expenses of the plaintiff in its Chicago area for each of the years 1923 to 1931, inclusive, which are attributable or chargeable directly to its intrastate business and to its interstate business, and there are certain other revenues and expenses which must be apportioned
685 between these two classes of service on the basis of use.

In making the apportionment (to which I shall refer in just a moment), the revenues and expenses were either apportioned on the basis of the use of the property, or directly allocated where no apportionment was necessary.

I prepared the instrument identified as Plaintiff's Exhibit A-48. It shows the various methods that I have used in separating and apportioning the revenues and expenses of the Chicago exchange, for the years 1923 to 1930, between exchange, intrastate toll and interstate toll. This exhibit sets forth in detail the methods which I have used in arriving at the separation and apportionment of the revenues,
686 expenses, and net income of the plaintiff Company in its Chicago area, as shown by the separation exhibits which I have prepared, and which will shortly be introduced in evidence; and proceeds upon the basis of station-to-station separation. Exhibit A-48 was prepared for use in connection with the separation for the years 1923 to 1930. The same methods were used for the 1931 separation. During 1931, there were some minor changes in accounting practices, but they did not affect the methods of separation.

In my opinion as an accountant, the methods used in making this separation of the revenues, expenses and net income

of the plaintiff with respect to its exchange, intrastate and interstate toll business, are correct and proper methods.

When the methods which I have used are applied to the
687 Chicago area revenues, expenses and net income, they will, in my opinion, produce a proper separation and apportionment of such revenues, expenses and net income for the years 1923 to 1931, inclusive, as between its exchange, intrastate and interstate toll business.

The instrument identified as Exhibit A-49 (in 9 sheets), showing the separation in dollars of the revenues, expenses and net income of the plaintiff in its Chicago area for each of the years 1923 to 1931 (the result for each year being on a separate sheet), was prepared by me and under my supervision. The total revenues and expenses for the Chicago area are shown in the last column, headed "Total Chicago." The various items which make up these amounts were apportioned to exchange, intrastate toll and interstate toll, based on the various methods outlined in my previous Exhibit A-48. The amounts shown in the "Total Chicago" column are the book figures after eliminating certain revenues and expenses applicable to non-operating property, and after adjusting
688 the tax accruals on the books for the years 1923 to 1929 to agree with the actual taxes paid for each of those years.

For the years 1930 and 1931, the tax figure that I have shown represents our best estimate of the amounts that will have to be paid for each of those years, based on the latest information available at the time the exhibits were prepared.

The revenues do not include any of the interest or dividend revenues that we have received on funds invested in securities of connecting telephone companies, or on any U. S. Treasury Certificates, or on funds loaned to the A. T. & T. Company which are not needed for telephone operations.

When I mentioned that I have excluded all revenues and expenses applicable to non-operating property, I meant it
689 to include taxes on non-operating property. I do not as yet have the definite amounts of either the assessments or rates for the 1930 and 1931 taxes, so that the exact payment

is not known. We are just getting the 1930 tax bills in at the present time, but we have not as yet received them all.

The item near the bottom of the sheet (Exhibit A-49), designated "Net compensation to Chicago for use of Chicago properties for 'Other than Chicago' purposes and use of State area properties for Chicago purposes" was taken from another exhibit which I prepared, and which will be introduced shortly. (This exhibit was later introduced as Exhibit A-51.) The next line, designated "Balance available for return under present rates", represents the net income under our present rates shown by the distribution of the book figures, plus the net compensation to Chicago for use of Chicago properties for State area purposes. The next line shows the reduc-
690 tion under rates in suit, the total amount of which was taken from another exhibit which I have prepared. The last line is merely the difference between the balance available for return under our present rates and the reduction under rates in suit.

This explanation of the first sheet of Exhibit A-49 applies to the figures appearing on each of the 9 sheets of the exhibit for each of the years.

I have prepared within the last few days, at counsel's request, an exhibit identified as Plaintiff's Exhibit A-50, consisting of 9 sheets, and showing the separation of the revenues and expenses of the plaintiff in its Chicago area for each of the years 1923 to 1931 on the identical basis as shown in Exhibit A-49, except I have excluded all overheads on lands. There is no other difference than that which I have indicated, that is, the exclusion of overheads on land, between Exhibits A-49 and A-50.

I have also prepared an exhibit in 2 sheets, which has
691 been identified as Exhibit A-51, and which shows in detail the various items making up the net compensation to Chicago for use of Chicago properties for other than Chicago purposes. The first page shows this information for the years 1923 to 1930, inclusive, and the last page, for the year 1931. This statement shows in detail the various items which were considered in arriving at the net compensation to Chicago

for the use of Chicago properties for State area purposes. It consists principally of annual charges, including an 8 per cent return on that part or portion of the Company's owned land and buildings, office furniture and fixtures, general store equipment, general stable and garage equipment, general tools and implements, official private branch exchanges, certain central office equipment, and related plant located in Chicago but used for State area purposes. This is offset by similar annual charges, including an 8 per cent return on Company owned land and buildings, office furniture and fixtures, general stable and garage equipment, certain cen-
692 tral office equipment and related plant located in the State area but used for Chicago purposes. It also includes other items, such as improvements to leased buildings in Chicago used for State area purposes. It considers telephone service furnished on a concession basis to State area employees residing in Chicago. It includes a part of the cost of the official telephone directory, which lists our State area employees in Chicago, and the portion of the Federal Income Tax which is related to the various items shown on the exhibit.

Mr. Mapes, in apportioning the total property in Chicago between exchange, intrastate toll and interstate toll, included the portion of the Chicago property used for State area purposes in his valuation of intrastate exchange property. In order to compensate for the inclusion of that property in the exchange valuation, it was necessary that I add to the net income from our intrastate exchange operations, a
693 compensation figure to cover the inclusion of that property in his exchange valuation. On the other hand, there is a certain small portion of property located in the State area which is used in part for Chicago area purposes. In making compensation to Chicago for the use of its property located in Chicago for State area purposes, I offset it by a corresponding credit to the State area for Chicago's use of State area property. By this method, I think I have fairly and justly compensated Chicago for the situation which I have described. The net amount of the compensation in each of

the years appears as the last figure in each of the columns on sheets 1 and 2 of Exhibit A-51. This varies from an amount of approximately $144,000 to an amount of $313,000; the largest amount being for 1925.

694 I also prepared an exhibit in 2 sheets which shows the basis for the figures appearing opposite the phrase "Less reduction under rates in suit", shown on each sheet of Exhibits A-49 and A-50 (which said exhibit was identified as Plaintiff's Exhibit A-52). In line 1 of this exhibit is shown the decrease in the annual revenues which would have resulted from rates in suit had they actually been in effect during each of the various periods. These figures were furnished me by Mr. C. R. Findeisen, the General Commercial Supervisor of our Chicago area. The next line shows the decrease in traffic expenses had the rates in suit been in effect during each of the years from 1923 to 1931. This amount was furnished me by Mr. S. S. Smith, Traffic Engineer of the Chicago area. In line 3, I have shown the decrease in licensee revenue payments that we would have made had the rates actually been in effect during each of the years. Similarly, in line 4 is shown the decrease in the 3 per cent payment to the City of Chicago. Line 5 is a total of the preceding lines 2, 3

695 and 4. In line 6, I have shown my estimate of the increased revenue accounting expense that we would have incurred during each of the years had the rates been actually in effect. Line 7 is a net figure, after deducting line 6 from line 5, and in line 8 is the net after deducting line 7 from line 1. In line 9, I have shown the decrease in the amount of Federal Income Tax that we would have paid had the rates actually been in effect during each of the years.

These amounts were used by me in preparing Exhibit A-49, and for the year 1923 I have extended the amount shown on Exhibit A-52 for the three months October to December to an annual basis by multiplying the figure of $389,310 by 4. This figure, $389,310, covers only the months of October, November and December, 1923, because the proposed rates were to have become effective October 1, 1923. I arrived at the annual

696 effect in 1923 merely by multiplying that figure by 4.

I have explained sheet 1 of Exhibit A-52. Sheet 2

contains information compiled on the identical basis, but of course in varying amounts for the year 1931. These net amounts were apportioned by me on Exhibit A-49 to exchange, intrastate toll and interstate toll, on the same basis that the related amounts included in the exchange revenues were apportioned. That is, they were apportioned on the basis of the use of the subscribers' lines for intrastate and interstate business.

I prepared the exhibit identified as Plaintiff's Exhibit A-53, which is in 9 sheets, and shows for each of the years 1923 to 1931, both inclusive, the rates of return under the present rates and under the rates in suit, based both on average reproduction cost new less depreciation of plaintiff's
697 property in its Chicago area, and upon the average book cost of the plaintiff's property. The figures appearing in lines 2 and 3 represent the balance available for return under present rates and under rates in suit, as taken from my previous Exhibit A-49. The fourth line shows the reproduction cost new less depreciation of plant in service and general equipment, as taken from Exhibit A-42 introduced by Mr. Mapes.

The next item is construction work in progress. This is a book figure which I have apportioned to exchange, intrastate toll and interstate toll by classes of plant, on the basis that Mr. Mapes apportioned the corresponding classes of plant in service. In this connection, the amount for 1927 was adjusted to correct for an over-clearance made on the books at that time.

The next item is going value. This represents Mr. Sloan's figure, which I apportioned on the basis of the separation made by Mr. Mapes of the reproduction cost of the total plant in service, including general equipment.

Line 7 is merely a total of the preceding lines 4, 5 and 6. In line 8 is a mean average for the year. It has been deter-
mined by taking the balance at the beginning of the year
698 and at the end of the year, and dividing by two. Now, in the case of 1923, I did not have a balance at the beginning of the year for the reproduction cost of the property, so I

determined what the ratio was, based on the book costs; that is, I determined, first, the average book cost, and related that to the book cost at the end of the year, and then applied that percentage to the figures appearing in line 7, as the reproduction cost at the end of the year.

In order to ascertain the rate of return under the present rates and under the rates in suit, based upon the average reproduction cost new less depreciation and the average book cost, I applied the net income, not to the property in service at the end of the year, but to the average property in service during the year. I obtained this average property for the year by the methods I have just described.

The item appearing in line 9 (Exhibit A-53) represents the average material and supplies. This is a book figure, and
represents the average of monthly averages that I have
699 apportioned on the basis of the reproduction cost of the plant in service, including general equipment. The next item of average working cash capital, including its distribution to intrastate and interstate, was furnished to me by Mr. Cleveland, Vice President of the Illinois Bell Telephone Company. Line 11 is the total.

Line 12 is the book cost of the plant in service and general equipment at the end of each year, which I have apportioned in total on the basis of the reproduction cost of the plant in service and general equipment, as spread by Mr. Mapes. In this connection, I made certain adjustments because of delayed displacement entries treated on the books in 1924 and 1929. I also made an adjustment of the figures at the end of 1927, because of the over-clearance of construction work in progress that I mentioned a little while ago. The item appearing in the next line, construction work in progress, is the same as line 5. Line 14 is a total, and line 15 is an average
for the year. Lines 16 and 17 are the same figures as
700 appear in lines 9 and 10, and line 18 is the total. In the lower portion of the exhibit, I have shown the per cent of return under present rates and under rates in suit, based on the average reproduction cost new less depreciation, as shown in line 11, and the average book cost as shown in line 18.

The first sheet of Exhibit A-53 shows on line 20, "Per cent of return under present rates based on average reproduction cost new less depreciation." In the first column, the per cent return on exchange is shown as 3.52; in the second column, the per cent return on intrastate toll is shown as 9.20; and in the third column is shown the per cent return for the total intrastate property of 3.77. It is upon that same general plan that all of these sheets are set up.

I prepared recently, at counsel's request, an exhibit in 9 sheets identified as Plaintiff's Exhibit A-54, which shows
701 the rate of return based upon the present rates and the rates in suit, both with respect to reproduction cost new less depreciation and average book cost, but excluding all overheads on land. The general explanation which I have just made with respect to Exhibit A-53 applies with equal force to Exhibit A-54. The amounts available for return, of course, were taken from another exhibit (Exhibit A-50), and the reproduction cost new less depreciation was taken from an exhibit introduced by Mr. Mapes as A-44. Other than that, the same explanation applies. In the preparation of this exhibit, I have applied the same methods used in the preparation of the other exhibits, except with respect to this Exhibit A-54 I have excluded all overheads on land, and made any related changes that were rendered necessary by such exclusion.

I have prepared a statement identified as Plaintiff's Exhibit A-55, in 9 sheets, which shows a station-to-station
702 separation and apportionment of the revenues, expenses and net income of the plaintiff for each of the years 1923 to 1931, and also the rate of return, but with depreciation and amortization of landed capital based on reproduction cost new, with the related changes in Federal Income Tax. This last exhibit (A-55) was prepared in identically the same way, using identically the same figures as Exhibit A-53, except that in Exhibit A-53 the depreciation and amortization of landed capital were figured upon book cost, and in Exhibit A-55 I have based these expenses upon reproduction cost new, and have made the related changes in Federal Income Tax.

I have also prepared from the books of the Company an exhibit, in 2 sheets, identified as Plaintiff's Exhibit A-56. This exhibit shows the Company operated stations in service in its Chicago area at the end of each of the years 1923 to 1930, and as of June 30, 1931, and at the end of 1931, together with the net increase or decrease in stations during each of the periods.

703 I have also prepared an exhibit, in 3 sheets, identified as Plaintiff's Exhibit A-57, showing for each of the years 1923 to 1931, both inclusive, the annual gross additions, displacements and net additions to plant in service and general equipment of the plaintiff in its Chicago area. The figures in this exhibit were taken from the Company's records for each of these years.

I have likewise prepared an exhibit identified as Plaintiff's Exhibit A-58, in 3 sheets, which shows in parallel columns as of December 31 for each of the years 1923 to 1931 the plant in service and general equipment accounts for the Chicago and State areas of the Illinois Bell Telephone Company separately. This exhibit is self explanatory.

I have prepared the statement identified as Plaintiff's
704 Exhibit A-59, which is in 2 sheets. This exhibit shows a comparison of the Commission's allowance for maintenance and depreciation with the actual charges for maintenance and depreciation accruals as shown by the Company's books, and with the actual charges for maintenance and retirements as shown by the Company's books, for each of the years from 1923 to 1931. On pages 1 and 2 of this exhibit appear certain stars or designations after figures for the years 1928, 1929, 1930 and 1931, and the notation that those are red figures. That means that the Commission's allowance for maintenance and depreciation was less than the actual charges shown on the Company's records for maintenance and retirement.

I have also prepared an exhibit from the books of the Illinois Bell Telephone Company in its Chicago area identified as Plaintiff's Exhibit A-60, showing an analysis of the fixed

capital reserves of the Company in its Chicago area for the years 1923 to 1931, both inclusive.

705 All of the exhibits which have been identified during my testimony correctly and accurately reflect the entries appearing on the books of the Illinois Bell Telephone Company for its Chicago area, except where I have already testified that I have made certain adjustments, or where I have testified that the figures have been furnished me by other witnesses.

The instrument identified as Plaintiff's Exhibit A-61 shows what percentage of our gross purchases from the Western Electric Company for the Chicago area are chargeable to maintenance and other expense accounts, for each of the years 1923 to 1931.

I have also prepared Exhibit A-62, which shows the 706 book cost of local manual central office equipment of the Illinois Bell Telephone Company in its Chicago area, for the end of each of the years 1923 to 1931.

707 The net telephone revenues of the Illinois Bell Telephone Company in its Chicago area for the year 1931, after making the adjustments which I have already de- 708 scribed in my testimony, were $9,882,253. 41,844 stations were lost by the Company in its Chicago area during 1931. There has been a further loss of stations by the Company in its Chicago area in the months of January and February of 1932. For January, this loss was 6,579, and for the month of February it was 7,268 stations. The net loss of stations for the first day of March, 1932, was 312.

There has been a decrease in the calling rate from the end of 1930 to the present time. The average daily calling rate per station for January, 1931, was 4.21; in January, 1932, 709 it was 4.02. That is a decrease of .19 of a call per day per station in the calling rate in the Chicago area. A reduction in the calling rate affects the revenues of the Company; it has a very close relationship to the revenues. We have no flat rate service in the City of Chicago, all of the service is measured; so the revenues of the Company depend upon the number of calls as well as the number of stations in

service. There is no indication at the present time that the Company might cease to lose stations during the year 1932; we have had a rather large loss during 1931, and we have continued to lose stations so far during 1932.

For the year 1931, the revenues do not reflect the total
710 loss from the stations taken out during 1931, as the revenues for 1931 include all of the revenues collected from all stations in service during the actual period that they were in service, although some of them were subsequently removed. In addition, the calling rate has been decreasing, and that has an effect on the revenues which was not fully realized during 1931. If a certain number of stations were removed in February of 1931, the revenues for those stations were included in our January revenues, and so on throughout the year; as stations were removed, the revenues from those stations were reflected for the portion of the time that they were actually in service during 1931.

I have prepared an exhibit, identified as Plaintiff's Exhibit A-63, which shows the message tolls, Account 510, received by the plaintiff in its Chicago area during each of the months of 1930, each of the months of 1931, the totals for the two years, and the message tolls for January, 1932. This
711 exhibit is a correct statement of the Message Toll Account of the plaintiff Company in its Chicago area, as reflected by its books.

(Plaintiff offered Exhibit A-63 in evidence and it was admitted and received.)

713 C. R. FINDEISEN, called as a witness on behalf of the plaintiff, having been first duly sworn, testified as follows:

Direct Examination by Mr. Thompson.

My name is C. R. Findeisen. I reside at 2342 North Kedzie Boulevard, Chicago. I am General Commercial Super-
714 visor for the Chicago area of the Illinois Bell Telephone Company, which position I have held for about 2 years. I have been connected with the Illinois Bell Telephone Company for about 16 years. Prior to my appointment as General Commercial Supervisor, I was for 2 years General Sales Manager; 5 years, Traffic Supervisor and Traffic Results Engineer; 3 years, Traffic Supervisor; 2 years, in the Engineering Department; and the balance of the time in the Traffic Department. In the last 10 years of my employment by the plaintiff, I have been engaged in those portions of the Traffic and Commercial Departments having to do, among other things, with the effect of rates, both on the question of revenue, and on the question of subscribers' usage.

I have made a study of the effect on subscribers' usage and gross revenue of the Chicago area of the plaintiff, if the rates fixed by the order of the Illinois Commerce Commission dated August 16, 1923, had been put into effect. The
715 figures appearing in the first line of Exhibit A-52 for each of the years 1923 to 1931 shown opposite the words "Decrease in annual revenues from rates in suit," were furnished by the Commercial Department, as a result of the study to which I have already testified, to Mr. Kruse, for use in the preparation of this Exhibit A-52.

I also made certain calculations with respect to the usage which would have resulted had the proposed rates been put into effect, and furnished such calculations to the Traffic Department for the purpose of figuring the dollar result on traffic expenses had these rates been established. Those
716 figures to which I have last referred were given to Mr. S. S. Smith, Traffic Engineer of the Chicago area of the Illinois Bell Telephone Company.

I prepared the instrument, identified as Plaintiff's Exhibit A-64, which shows the rates now being collected by the Illinois Bell Telephone Company in Chicago from the four classes of coin box service affected by the order of the Commission, and the rates fixed by the Commission's order for the same classes of service. This exhibit further shows the daily, monthly and annual rates, the number of messages under the respective guarantees, the rates for excess messages, and the rates of the present two-party measured residence service of the Company, with the same details. It correctly sets forth what it purports to show.

From my experience in the telephone business, I am familiar with the effect of changes in rate schedules on dollar revenue and on subscribers' usage, and by that I mean the number
717 of messages used by a given group of subscribers under varying guarantees. In arriving at the figures appearing in line 1 of Exhibit A-52 (referring to decrease in annual revenues from rates in suit), there is involved, first, the decrease in revenues in all four classes, because of the decreased rates; secondly, the decreased usage of the four-party coin box subscribers, because of the decreased guarantee; and, thirdly, a regrading of certain of the two-party measured subscribers to the four-party coin box class.

With respect to the individual business coin box, the two-party business coin box, and the two-party residence coin box, I arrived at the decreased revenues which would have been received under the rates of the Illinois Commerce Commission had they been put into effect, by applying such decreased rates to the actual usage of these three classes as obtained from our records. In doing that, I did not assume that there would be an increased usage in these three classes of service re-
718 sulting from the reduced rate, because it is my experience that a decrease in the rates of these three classes does not tend to show any increase in their usage. They are already using, at a higher rate, whatever their telephone requirements may be.

It is, possibly, the general rule in the utility business that if the price goes down, the quantity consumed is increased,

except where they are already using all that their requirements may be.

719 With respect to the fourth class of service, the four-party residence coin box class, experience has shown that a change in usage results from a change in the guarantee. There are included in this class those persons who desire telephone service at the lowest cost in the Company's
720 entire structure. Under the rates now being collected, the guarantee is $2.745 per month of 30.5 days, with 54.9 messages for the same period. Under the rates fixed by the Commission, the corresponding guarantee is $2.2875, with 45-3/4 messages. There is a difference there of not quite, but almost, 50 cents in the amount of the monthly minimum rate and a difference of about 9 messages per month.

It is my opinion that, during the years involved in this study, between 60 and 70 per cent of these subscribers would not have exceeded the guarantee under the rates fixed by the Commission. After determining the number of subscribers who would not exceed the guarantee, and those who would, we applied the rates as fixed by the Commisison in order to determine the decrease in revenue which would have resulted if those rates had been put into effect.

721 There was a substantial difference between the amount of the minimum monthly payment under the two rate schedules, and also a substantial decrease in the amount of messages which a man could get without making an extra payment. I made a study of this class of coin box service in order to determine what the usage was, and found that from 60 to 70 per cent of the total number of subscribers using the service would be under the message guarantee fixed in the proposed rates. Therefore, I assumed that, their mes-
722 sage use, being within the message allowance which they would get for their minimum monthly payment, there would be a decreased usage. The four-party residence coin box service is the lowest rate.

The individual business coin box service, the two-party business coin box service, and the two-party residence coin box
723 service are classes of service where the minimum monthly payment and the number of messages for that monthly

payment are in each instance higher than the minimum monthly payment and the number of monthly messages for the four-party residence coin box service, both under the rates now collected by the Illinois Bell Company, and under the rates fixed by the Illinois Commerce Commission. For the individual business coin box service under the present rate, there is a guarantee of $6.10 per month, with 122 messages, and messages thereafter are paid for at the rate of 5 cents each. The proposed rates of the Commission reduced this monthly guarantee to $5.49, and the number of messages from 122 to 109.8; the excess messages were to be charged for under the Commission's proposed rates at 4 cents each.

For the two-party business coin box, the guarantee under our present rates is $4.575 per month, with 91.5 messages.
724 Under the schedule proposed by the Commission, that guarantee was $3.965, with message use reduced to 79.3 messages, and with the excess messages at 5 cents each up to a certain point, and thereafter at 4 cents each.

Under the present schedule, the minimum monthly payment for the two-party residence coin box service is $3.8125 per month, with 76¼ messages, and under the proposed rates of the Commission, $3.355 per month, with 67.1 messages guaranteed and excess messages at 4 cents.

The reduction made by the Commission in the dollar monthly guarantee in these classes of service, is a less proportionate reduction, based upon the monthly rate now in effect, than that made in the four-party residence coin box service. The message usage for the minimum guarantee
725 is substantially higher, both under the Company's rates and under the rates proposed by the Commission, than the monthly guaranteed messages for the four-party coin box service.

The percentage of subscribers that exceed the guarantee in these three classes (two-party residence, two-party business and individual business), is somewhat higher than the percentage that exceed the guarantee under the four-party coin box rates. A higher percentage exceeds the guarantee in the one and two-party coin box classes than they do in the four-party. Starting from that fact, it is my opinion that the rate

schedule is so fixed now, and was so fixed by the Commission, that the change proposed by the Commission would not
726 have induced a greater telephone usage in those three classes of coin box service, because the guarantees in the one and two-party classes do not control the usage to the same extent as in the two-party coin box business or residence classes. The subscribers are paying a higher rate for the telephone service because their usage is well in excess, or will be in excess of the four-party guarantee, and the total usage that they are going to make in the course of a month's time does not bother them. They are using all of the telephone service that they need, all of the time, regardless of the rate. I don't think the fact that in the present rate schedule in these three classes of service the excess message is 5 cents, and under the Commission's rates it is in most instances 4 cents, will have much effect on increasing the number of excess calls.

It is my opinion that, if the proposed rates had been put in effect, some of the two-party measured residence subscribers would have taken the four-party coin box service, because of the rate differential; this is known as regrading. Under
727 the rates now being collected for two-party measured service, the guarantee is $2.75 a month with 55 messages. Our records show that from 51.5 to 63 per cent of these subscribers use 45 calls per month or less, and that usage is below the message guarantee for the four-party coin box subscribers as fixed by the Commission. These persons then by regrading to the four-party coin box service, could save approximately 45 cents per month, and still get the same message usage as they had in the two-party class. I did not assume, however, that all of them would regrade, but, on the contrary, only 40 per cent of that group that fall below 45 messages per month. In addition, 12 to 16 per cent of this group use from 46 to 55 messages. I assumed that 20 per cent of those would regrade, and that their message use would be 49 to 50 calls per month. The latter class will save something by regrading from the two-party service to the four-party coin box under the Commission's proposed rates,

when they are that close to the guarantee in those months
728 where they do not exceed it; but I have assumed that only 20 per cent of this latter group (consisting of 12 to 16 per cent that use that number of messages), will, in fact, regrade from the two-party measured to the four-party coin box, in the event that the Commission's rates should be put in.

I furnished to the Traffic Department figures based on this study to which I have just testified, showing the decreased message usage which would have resulted had the Commission's rates been put into effect, in order that the Traffic Department might figure the decreased traffic expenses attributable to such decreased usage. The results of that study are shown on Exhibit A-65 which I have prepared.

(Plaintiff offered Exhibits A-64 and A-65 in evidence Objections reserved until after cross-examination.)

729 *Cross-Examination by Mr. Haight.*

The decrease in rates shown in Exhibit A-64, based upon the order of the Illinois Commerce Commission here in question, would not increase the use of telephones. If the rates were just half those of the order of 1923, it might in some instances increase the use of telephones, and it might not
730 in others. It would increase the use, possibly, of those subscribers who are already using considerably in excess of the guarantee; except in the case of such subscribers, it possibly would not increase the use of telephones in the City of Chicago.

I have already stated that the rates proposed, in my opinion, would not tend to increase the usage.

731 If the subscribers are already using all of the telephone service they require, they cannot use any more than they need because the rate is decreased. It is my opinion that the rate has nothing to do with the extent of the use.

Q. Now, there are some instances in this postulated case of just half the rates of those set up in the Commission's order of 1923, in which it would not increase the use of tele-
732 phones in the City of Chicago. What ones did you have in mind, in making that answer?

A. Well, I do not see quite where that applies, because they could get—those subscribers could get a much lesser rate by taking a lower grade of service.

We have not assumed that the rates might be reduced 50 per cent. I based my opinion that the rates of 1923 would not increase the usage on 16 years of experience. We had an increase of local exchange message rates in the City of Chicago. To my personal knowledge we have not had a decrease. I would not say in that respect that the experience I mentioned does not exist; it does exist. We have had the experience of the change in rates from the two-party to the four-party rates. I have never at any time had any experience with a decrease. When I say that I have based my opinion upon experience, I do not mean any experience whatever with a decrease in local exchange rates.

733 My testimony upon direct was based only upon the use of the average number of existing subscribers in each of the years. This takes into consideration the growth in each of the years, and the gain or loss in stations. I have here the information concerning the growth and gain or loss in stations for each of the years.

734 This document, headed "Estimated revenue effect of proposed rates," shows four groups (A, B, C and D), which are, respectively, the average number of subscribers to the one-party coin box business, the two-party coin box business, the two-party coin box residence, and the four-party coin box residence. The next page has to do with the regrading of the two-party measured rate subscribers to the four-party coin box class.

735 In group A (which is the one-party coin box business), we arrive at the average number of subscribers for each of the years 1923 to 1931 from our records. I do not remember if those are the average by months, or whether they are the average of the first and the end of the year. The same is also true in regard to each of these groups, B, C and D; it is either the average taken from the 12 months of the year, or the yearly average.

There was a gradual increase of the one-party coin box

service from 1923 to 1930, with a drop in 1931. There have been no exhibits prepared giving these figures.

In group B (that is, the "2 C.B." or two-party coin
736 box business class) there were 29,000 odd subscribers in each of the three years 1923 to 1925, and a reduction in that number each year down to 1931. Of course, in the years 1930 and 1931 there has been a general loss in stations. The gradual decrease of the number of subscribers in this class from 1926 down to 1931 is because it is not a comparable service. Convenience and privacy of service for business purposes force the regrading to the one-party coin box single line; that is, the customers change from one class to the other, but I would not say that the change is very great.

In group C (the two-party coin box residence service) there
737 were, in 1923, 11,000 subscribers; in 1930, there were 32,000; and in 1931, 31,000. We have more subscribers in all classes than we had in 1923; that is the growth of the business. This class of service is not comparable to group B (two-party coin box business); because they are two different types of service. This is a residence service and group
738 B is a business service. My explanation of the increase in this class is the growth in the Company's business. The subscribers in this class, that is the two-party coin box residence class, increased about three times during the period 1923 to 1930.

With reference to Plaintiff's Exhibit A-64, prepared by me, I was aware of changes by the customers from the four-party coin box service to the two-party measured rate service. We obtained, first, the two-party service as compared with the four-party service. In general, the two-party measured rate service is somewhat more convenient for the subscribers. They set up an account and pay their bills in advance; it is not a pay-as-you-go service. It is a little higher type of service, and the rate differential is very slightly different under the existing rates.

I cannot state specifically whether or not, during the years 1923 to 1931, there has been a tendency to change from the

four-party residence coin box service to the two-party residence coin box service. I do not have the figures available here.

739 The groupings in Plaintiff's Exhibit A-64 are the same as the four groupings which I have heretofore discussed with respect to the individual business coin box, two-party business coin box, two-party residence coin box, and the four-party residence coin box, as shown on the sheet I described a minute ago. The groupings are identical.

The groupings on the sheet which I have just described were: group A, "1 C.B.", individual business coin box; group B, "2 C.B.", two-party business coin box; group C, "2 C.R.", two-party residence coin box; and group D, "4 C. R.", four-party residence coin box.

I haven't here the definite percentages of the various classes; I haven't those on any separate table.

740 I am not familiar with any figures on long distance service. I assume there has been an increase in local tolls.

742 As I stated before, I have spent all of my time with the Illinois Bell Telephone Company. It is not at all the fact that I have had no experience upon which to base my testimony.

I reside at 2342 North Kedzie boulevard, Chicago. I 743 have never used a suburban telephone. I have used a long distance telephone. I have learned something about long distance rates in connection with my use of the long distance service. During that time I have known of decreases in long distance rates. I have used the local toll lines, but that use has been very slight. It has been exceeded by my long distance calls. I could not even guess how often I have been in the habit of using local tolls, but I have used the long 744 distance service probably two or three times a month on personal business.

To a certain extent, I have had experience that showed that decreased rates result in more people acquiring telephones. That experience, broadly speaking, is the development in Chicago, as compared with other cities where the rates are somewhat different. I know nothing about the financial status of

the telephone subscribers. There is no tendency being indicated at the present time by the so-called moderate customer to use the telephone more and more. The classes as a whole increased their usage at some times.

745 I have no knowledge as to whether or not telephone users are attracted to the use of a telephone through a
746 decrease in rates; my opinion, in view of my long experience in the business, would be that they would not use it any more than they do now. I am speaking of non-users.

If the present rates were reduced to 10 per cent of what they are now, it probably would induce some non-users
747 of telephones to use them. If you give something away everybody will want it. I cannot say definitely that the same principle applies to a decrease of the price of a thing. For example, I eat three meals a day. If those meals are reduced from one dollar to fifty cents, I cannot eat six because they have come down to fifty cents, but I suppose that if I ate nothing and meals were offered within the range of my pocketbook, I would then eat. Using the same analogy, the increase of the appetite for telephone use by reason of the reduction in the rates would, in my opinion, depend upon the reduction; that is, a small reduction would have nothing to do with it and a large reduction would.

748 I cannot conceive of anybody not having a telephone because it is not necessary; the telephone is a necessity. It does not follow that all who could pay the price would use the telephone, but a very large percentage of them would.

If the guarantee on service were reduced, some few of those people who now go to public pay stations, drug stores, etc., might put in a telephone, but I would not venture to guess the number.

749 By way of general supervision, I have to do with the subscribers' contracts in the City of Chicago. I have not any forms of these contracts with me. The two documents handed me by counsel for the City are, in general, all of the forms of subscribers' contracts used in the City of Chicago for the years 1923 to 1931, both inclusive. I think there have

been some minor changes in the get-up of the forms; that
750 is, in the columns provided for entering information, or the rearrangement of the spaces on the contracts. Save for that, they are identical with those used throughout that period and are the only ones used.

(Said documents were marked for identification as Defendants' Exhibits D-9 and D-10, respectively.)

I do not have anything to do with the handling of rate schedules in Chicago.

The abbreviation "Mess." in the last column of
751 Exhibit A-64 means messages. By "message" I mean a completed chargeable call from one station to another in Chicago, and, as applied to these rate schedules, in Chicago only.

I think numbers of the subscribers to the four-party service would go to the two-party service if the two-party line rates were decreased.

The sheet heretofore discussed, headed "Estimated revenue effect of proposed rates", is one of my work sheets
752 (which said document was marked for identification as Defendants' Exhibit D-11) This sheet was based upon the average number of existing subscribers in each year involved.

753 *Re-direct Examination by Mr. Thompson.*

The work sheet which has just been marked for identification as Defendants' Exhibit D-11, contains certain data and information compiled in connection with making an estimate of the revenue effect of the proposed rates established by the Illinois Commerce Commission. In each of the four classes included on this exhibit, we have treated the average number of subscribers for each year as they actually
754 existed under the Company's existing rate schedule. If there were any increase from year to year in the number of subscribers in a particular class of service, that increase is reflected in this Defendants' Exhibit D-11, as is also any decrease in the number of the Company's subscribers using a given class of service.

I have never in my experience with rate matters heard of any rate fluctuation in Chicago, or anywhere in the United States, which amounted to as much as 50 per cent of the total monthly payment of a given subscriber. What I have considered in my work and in the exhibits which are presented here, has been the effect upon the use of subscribers' of the Illinois Bell Telephone Company of the rates fixed by the
755 Illinois Commerce Commission, where the reduction was, roughly speaking, on the order of from 50 to 70 cents per month. Of course, if a very violent rate fluctuation were made, either upward or downward, that would have quite a different effect than if a moderate change were made one way or the other.

I have devoted practically all of my time since I have been with the Company, and certainly in the last ten years, to the study of its rate schedules, and various traffic and engineering matters connected with that sort of work.

Re-cross Examination by Mr. Haight.

Whether or not withdrawals of telephones would be decreased if rates were decreased during depression
756 periods depends on the individual subscriber. I would not give a general opinion; it depends upon what the reduction is and upon the subscriber. I have an opinion as to whether withdrawals would decrease or not if rates were decreased during periods of depression, and assuming that people are trying to save some money. To a certain extent, they might retain their telephone service, but for the man who cannot pay anything it makes no difference what the rate is; he cannot buy it anyway. I cannot say as to what extent that rate reduction would decrease the number of withdrawals. In a general way, the assumption might be
757 made that there would be a lesser withdrawal.

Re-direct Examination by Mr. Thompson.

The extent of the lessening of telephone withdrawals during a period of depression resulting from a rate reduction depends entirely upon the amount of the decrease.

758 S. S. SMITH, called as a witness on behalf of the plaintiff, having been first duly sworn, was examined and testified as follows:

Direct Examination by Mr. Thompson.

My name is S. S. Smith, and I reside at 547 Ashland Avenue, River Forest, Illinois. I am an employee of the Illinois Bell Telephone Company, and am, and have been since 1928, Traffic Engineer of the Chicago area of that Company. I have been an employee of that Company since 1901, and have been practically continuously in the Traffic Department. I was, for a period of 10 years prior to the reorganization of the Company into areas, Traffic Engineer of the entire Company.

759 As Traffic Engineer, I am responsible for studies and plans made to determine the amount of facilities required to handle traffic properly. These facilities include central office switching equipment, certain private branch exchange switching equipment, and interoffice trunks. I am also responsible for the development of traffic data required in the preparation of equipment cost studies, usually headed up by the Chief Engineer, including estimates of traffic expenses entering into the studies.

It has been a part of my duties for the past 10 years to determine the actual cost of handling messages, as the cost relates itself to the volume of messages. The volume of traffic affects the expense of that traffic.

I am responsible for the figures appearing in line 2 of Exhibit A-52, opposite the title, "Decrease in traffic
760 expenses." In arriving at the figures on this exhibit for the years 1923 to 1931, I took into consideration the decreased usage in coin box service. I also took into consideration, in the two-party measured rate service, the decreased usage by reason of the regrading to coin box service which would have resulted from the putting into effect of the

Commission's rates of August 16, 1923. In both instances, I received the amount of decreased usage from the Commercial Department of the Company. All the dollar figures appearing on Exhibit A-52 in line 2 are based upon the figures furnished me by the Commercial Department, which I have used for the purpose of determining decreased traffic expenses.

I received from Mr. Findeisen the decreased usage which
761 he has testified would have resulted if the Commission's rates had been put into effect, and then evaluated that decreased usage in terms of dollars for each of the years.

Our traffic accounts are set up to show monthly the cost per thousand traffic work units. I translated the decreased messages into traffic work units, and from the cost figures which we have for each year, determined the savings which would result from the decrease in work units.

In my opinion, the figures shown on Exhibit A-52, in line 2, "Decrease in traffic expenses", correctly represent the savings which would have been made in traffic expenses by the Illinois Bell Telephone Company in its Chicago area if the decreased message use furnished me by Mr. Findeisen had actually taken place.

762 *Cross-Examination by Mr. Haight.*

There is no relation between the traffic expense and the gross income of the Company for each year. There is no relation between the revenue per message and the traffic expense for any class of service.

I presume that the rate per message is based upon the traffic expense as an element, but I have had nothing to do with that matter in my experience, and do not know who in the Company does have to do with it.

763 I figured the decrease in traffic expense on the cost per thousand traffic units, messages, ratios of messages to calls and traffic units. Those data are all assembled now under my control, and I would permit accountants of the defendants to look at them.

Re-direct Examination by Mr. Thompson.

The work sheets to which I referred and which are here in Court have never been examined by the representatives of the City of Chicago, but have been available for their examination constantly.

764 U. F. CLEVELAND, called as a witness on behalf of the plaintiff, having been first duly sworn, was examined and testified as follows:

Direct Examination by Mr. Thompson.

My name is U. F. Cleveland. I reside in Oak Park. I am the same U. F. Cleveland who testified on the former hearing of this cause. At that time I was General Auditor of the Illinois Bell Telephone Company and continued in that position up to the end of June, 1930, when I became Vice President in charge of the Financial and Accounting Departments of the Company. Since July 1, 1930, I have been continuously Vice President of the Company in charge of the two departments referred to.

765 There was a displacement made in the accounts of the Company in October, 1924, of $105,367.86. This displacement is the one referred to in the testimony of Mr. Andrew Sangster on the former hearing of this cause, appearing on pages 1141 and 1142 of the record, and also referred to by me in my own testimony on the former hearing, appearing on pages 1144 and 1145 of the record.

Of the $858,166 affected by the Main-Franklin manual central office equipment that was cut out of service in December, 1928, as referred to in the testimony of Mr. W. F. Sloan on this hearing, $737,833 was displaced from the books in January of 1929, and the balance of $120,333 was displaced from the books in March, 1929. The work under this estimate

766 provided for the displacement of Randolph, Franklin and Main manual units. The displacement entry for the Randolph unit was made in December of 1928, amounting to

$578,898. Plans were under consideration which involved the possible re-use of a portion of the Main-Franklin equipment, and the displacement entry was not made immediately, pending the consideration of those plans. The situation was called to my attention by the Chief Engineer, and I advised him to make the displacement entries. They were made in the month following the cutting out of service of the Main-Franklin unit, except for the $120,000, which was made in March, 1929, at the time the entire job was cleared up. At the time this matter was first called to my attention, the books for 1928 had already been closed.

Mr. W. F. Sloan has testified on this hearing that in December, 1927, there were transferred from Construction Work in Progress to Central Office Equipment in Service certain amounts before the equipment had actually been placed
767 in service. It is a practice, when work included in Construction Work in Progress is partly completed and put in service, for the Chief Engineer to notify the Accounting Department of the percentage so completed. From that advice, a proportion of the amount expended is cleared from Construction Work in Progress into Plant in Service.

In these cases, there were five estimates involved, and there were transfers made in both November and December of 1927. The November transfer was proper. In making the December transfer, the accountants neglected to take into consideration the amount of the November transfer, consequently there was an over-clearance to the Plant in Service account. Our routine check of the plant accounting transactions disclosed this fact in January of 1928, and the correction was made at that time. The incident having occurred at the end of the year, it was not corrected until the following year. When this amount referred to was transferred from Construction Work in Progress to Plant in Service, in 1927, the account for Construction Work in Progress for the year 1927 was
768 understated by the amount of the excess transfer. Mr. Kruse, in his exhibits in this case, has made an adjustment in this matter by decreasing his book figures for Plant

in Service and making a corresponding increase in Construction Work in Progress, both for the year 1927. The net effect of this adjustment is to leave the total of the plaintiff's Plant in Service account, plus Construction Work in Progress for the year 1927, unchanged.

Mr. W. F. Sloan has also testified on this hearing with respect to booths and special fittings, and particularly to the retirement unit costs in that account for the years 1924 to 1928. Up to the end of 1923, the estimated original cost of booths displaced was considered to be the current cost of a booth of similar character. Beginning with January of 1924, displacements were based on the average cost of booths. This average cost was obtained by dividing the dollars of the investment shown on the books by the number of booths
769 in use, as shown in the record maintained in the Plant Department. Along in 1928 it appeared that the unit costs used for displacement purposes were small. In attempting to clear up the situation and find what caused it, we made a complete field inventory of all the booths. This inventory showed a considerably smaller number of booths than was shown by the running record which had been used in previous displacements. As the inventory had been very carefully made, it was felt that we were justified in using it as the basis of our future displacements. Beginning, therefore, with 1929, displacements were made on the basis of average costs arrived at by using the inventory figures as the number in the plant.

I have never known what the exact reason was for the discrepancy in the number of booths and special fittings between the running account of the Company and the inventory. My judgment is that the plant record which was first used included not only the booths owned by the Company, but some owned by our agents and customers, which had been furnished by us but paid for by them. I say that because the inven-
770 tory made in 1928 disclosed that there were some 3,800 such booths in the plant not belonging to us. From the date we began to use the revised figures, the adjustment of any under-displacement which may have occurred in earlier years by reason of the use of the former retirement units

costs would be constant. If there had been any under-displacement by the use of the previous figures, that would have in time straightened itself out.

I know of no other accounting adjustments, either in respect to a lag in completing the accounting entries on the books after disposing of the physical property, or for any other reason, that ought to be taken into consideration in the figures used by Mr. Sloan in converting book costs of the Company.

Mr. Kruse has prepared, and there has been introduced in evidence by him, Plaintiff's Exhibit A-53, in 9 sheets, which shows the rate of return under the present rates and the rates in suit for each of the years 1923 to 1931, and shows also the reproduction cost new less depreciation of plant in service
771 and general equipment. In my opinion, the property as shown by the books of the Company for each of the dates referred to, as it is reflected upon this exhibit by means of the conversion factors used by Mr. Sloan applicable to book costs, was actually installed for use in furnishing service to the public in the Chicago area.

There are some very minor parts of the plant outside of the city limits that are used for furnishing Chicago exchange service, at Chicago rates, to a number of subscribers who are not located in the area assigned to the territory of suburban division exchanges. This minor part of the plant is included in the plant accounts of the books kept separately for the Chicago area. Outside of these very minor items, all of the plant and property covered by Exhibit A-53 is located in the City of Chicago.

772 The terms, "Chicago area," "Chicago division" and "Chicago exchange;" mean absolutely the same thing. They mean the territory of the City of Chicago with such minor modifications as I have explained with respect to those small items just outside the city limits.

On several of the exhibits introduced by Mr. Kruse, particularly on Exhibit A-53, in line 10, appears a figure "Average Working Cash Capital." I am responsible for those

figures. The operating expenses of the Company for the Chicago area for a period of six weeks was the basis of the figures used. In my judgment as an accountant, that is a fair and reasonable basis upon which to ascertain the cash working capital actually required for the Company's operation.

773 I believe that the dollar figures appearing on these several exhibits for average working cash capital state the amount necessary for working cash capital.

By "working cash capital," I mean the amount, exclusive of materials and supplies in this case, necessary to have invested in the business in order to provide for all expenses prior to the time that the money is collected and available for use.

Cross-Examination by Mr. Haight.

774 Part of the service that the Company furnishes to its existing subscribers is to make available additional subscribers. In order to do that, necessarily, we have to have more plant than is actually connected up for the existing subscribers. I know of no way to get at what that amount is, except to measure the plant that is not at the moment connected up for existing subscribers. I have no way of estimating the figure. The provision of this plant is handled through the engineering of the plant. The program for

775 making provision for the growth in the plant is a constant operation. These programs are discussed throughout the entire organization, and it is agreed as to what items of plant will be decreased and what items will be built. This program, in a general way, is found in the provisional estimates, but I do not think that the provisional estimates would indicate, even in a general way, what the spare plant will be in the future. The specific estimates providing for the particular installations would be more likely to indicate that.

"Q. Well, in the provisional estimates, would the program be shown in which spare plant is involved?"

"A. There is nothing specifically set up in the provisional

estimate which identifies what you refer to as spare plant, or what I understand you to refer to as such.''

776 The provisional estimate is a summarization of the plant that is required. I rather think that the fundamental plans would have something to do with that, although I have to confess an entire lack of familiarity with the fundamental plan work. I could not tell how the spare plant could be checked up during each year of the period involved here. If there is any way of making the determination of that, I do not know it. Provisional estimates running back over the years 1923 to 1931, inclusive, are in the Company's records.

778 I would be expressing an opinion if I stated what period of time in advance provisional estimates for spare plant are made, but it is my judgment that there isn't any specific number of days, hours, weeks, months or years under consideration. It is probably the anticipated new business which will come to the Company within a reasonable time. You can identify certain items of plant; for example, there would not be a building built this year that was going to fill the requirements only up to the end of this year. Just the length of time that building would provide facilities would depend very largely upon the facts with reference to that specific piece of property. As far as buildings are concerned, it would be my judgment that we would look forward a great many years. The same would be true of the central office

779 equipment. We would look ahead there some time, although I am not familiar with the period.

(Plaintiff offered Exhibits A-64 and A-65 in evidence, which were admitted and received in evidence.)

780 ANDREW SANGSTER, a witness called on behalf of the plaintiff, having been first duly sworn, was examined and testified as follows:

Direct Examination by Mr. Thompson.

My name is Andrew Sangster. I reside in Chatham, New Jersey. I am a Certified Public Accountant with offices in New York City. I have been a Certified Public Accountant for the past 11 years, but for 6 years prior to that time I was practicing as a public accountant.

I am the same Andrew Sangster who testified on the former trial of this cause, with respect to the accounting methods and practices of the Illinois Bell Telephone Company relating to its plant accounting, and with respect to the methods of separation of its property, revenues and expenses which had been made by Mr. Harris and Mr. Cleveland.

781 The examination of the Company's books and records about which I testified in the former hearing was for the period from July 31, 1919, to June 30, 1923. Since the former hearing, I have been employed by the Company to make a further examination of its books and records in certain particulars, and also to examine the work done in connection with the separation of its property, revenues and expenses.

I have examined the exhibits prepared by Mr. Mapes and introduced in evidence in this cause, relating to the separation of the Company's property in its Chicago area. I have likewise examined the exhibits prepared by Mr. Kruse and introduced in evidence during his testimony, showing a separation of the revenues and expenses of the Company in its Chicago area.

782 I began the work on the detail of the examination of the plant accounts of the Company early in January, 1931, and completed it during the first few days of July, 1931. In addition to that, I spent about a month's time reviewing the methods used by the engineers and accountants of the Telephone Company in the separation of its property, revenues and expenses in the Chicago area.

Most of the work which I did in connection with the separation exhibits was devoted to an examination of the
783 exhibits for 1923 to 1930. I have examined the exhibits for the year 1931 since my return to Chicago to testify in this cause.

Since my testimony on the former hearing, I have examined the plant accounts of the Company in its Chicago area, particularly with respect to the gross additions and retirements to and from the property during that period of time. The examination was to verify the gross additions to the property in the Chicago area, including betterments and replacements, and to verify the retirements of property during that time. From the examination which I have made of the books and records of the Company in its Chicago area, it is my opinion as an accountant that they are kept by the Company in accordance with the Uniform System of Accounts applicable to Telephone Companies, as prescribed by the Interstate Commerce Commission and by the Illinois Commerce Commission.

784 As the result of my examination of the books, it is my opinion that the fixed capital accounts of the Company for the Chicago area are correct in all fundamental respects, and show the actual cost of the plant, including gross additions, betterments and replacements; and all retirements have been accounted for. In connection with those retirements, I found two instances in which the record of the retirements had not been made until after the close of the year in which the plant actually had been displaced. One of those instances was the amount of approximately $105,000 to which I testified on the former hearing, and to which Mr. Cleveland has just testified: The other instance was the case of the Main-Franklin central office equipment which was cut out of service in 1928 and was not displaced on the books until January and March of the following year, to which Mr. Cleveland testified this morning.

785 I also ascertained in my examination that transfers had been made from Construction Work in Progress to the

Fixed Capital Account in December, 1927, with respect to certain additions in the Belmont, Hyde Park, Kedzie, Kildare and LaFayette offices. I found that correct entries had been made for these items in January, 1928.

I want to qualify the statement that I made that the books of the Company have been kept in accordance with the rules of the Interstate Commerce Commission and the Illinois Commerce Commission. There are certain elements of over-
786 head charges which have been included in the plant accounts only since the year 1920. I referred to this situation in the testimony which I gave at the previous hearing. These elements of overhead which have been included in the plant accounts and the fixed capital accounts for the Chicago area, only since 1920 represent interest during construction, traffic engineering, commercial engineering, and general expenses charged to construction. At no time down to the close of the year 1930 has anything been included for taxes during construction or insurance during construction. I mean, in connection with insurance, charges that are made to Account 668, insurance, and general and miscellaneous expenses which might be charged to fixed capital accounts, in so far as insurance is applicable to construction. I do not know how these two items, that is, taxes during construction, or interest during construction, have been handled in 1931; I have not examined the plant accounts for the year 1931. Certainly, no charges for taxes during construction or insurance during construction were carried into the overhead accounts down through 1930.

787 I have investigated the situation concerning the account of Booths and Special Fittings, which both Mr. Sloan and Mr. Cleveland referred to. Prior to the year 1924, booths and special fittings removed from service were retired on the basis of the current cost of similar classes of equipment. Beginning in 1924, retirements were based upon an average cost, determined by dividing the total booth cost in the account by the number of units in service, as shown by Plant Department records. This method has been continued down through 1930. As Mr. Cleveland explained, a field inventory was made

in 1928 of the actual number of booths in service in the Chicago area, and the number found was less than the number shown on the record maintained by the Plant Department.

788 This inventory quantity was put into effect in determining the average unit cost for booths and special fittings, and resulted in increasing that retirement unit cost from 1929 and then on. The effect of this increased retirement unit cost would be to more rapidly correct the account for any excess that might be present due to the use of a lower retirement unit cost.

I have before me Plaintiff's Exhibit A-40, which is the method used by Mr. Mapes in making the separation of the property of the Illinois Bell Telephone Company in its Chicago area. I also have before me Plaintiff's Exhibit A-48, prepared by Mr. Kruse, showing the method used by him in separating and apportioning the revenues and expenses of the plaintiff in its Chicago area. I have examined the methods that were set out in these two exhibits.

789 I have made a check of the separation figures in dollars and percentages appearing upon the exhibits introduced by Mr. Mapes, showing the separation of the property, and also the exhibits introduced by Mr. Kruse, showing the separation of the revenues and expenses. In the case of the figures introduced through Mr. Mapes, the Chief Engineer, I have not gone to the original sources from which he obtained his data, covering call volumes, time intervals and circuit mileages; as these are contained in records that are not familiar to me, I have not attempted to verify them in any way, but have followed through his treatment of the various fundamental factors in his separation studies, so my tes-

790 timony with respect to Mr. Mapes' exhibits should be limited by the statement I have just made, because of my lack of familiarity with the traffic data which Mr. Mapes used.

Both of these separations, that is, the property separation and the revenues and expenses separation, were made, generally, on the basis of the use of the property and the service for exchange, for intrastate toll, and for interstate toll purposes. By "use," I mean actual physical use. In other

words, the separations were made on the station-to-station basis.

In my opinion as an accountant, from the examination I have made of the methods used by Mr. Mapes in making the property separation, and those used by Mr. Kruse in making the separation of the revenues and expenses of the Company in its Chicago area, they are correct and accurate, and, when properly applied, will show separations and apportionments on the basis of the respective uses of the plaintiff's property in its Chicago area as between intrastate and interstate.

791 It is my opinion from the examination which I have actually made of the separation exhibits themselves, that the methods have been properly applied in making the separations.

Cross-Examination by Mr. Haight.

793 It is my opinion that the separations, both as to property and as to revenues and expenses, were correct. In giving that opinion, I have taken into consideration the fact that a portion of the exchange revenues have been placed in the interstate toll revenues for each of the years 1923 to 1931, inclusive. The separation studies show the amounts in each of the exchange revenue accounts that have been apportioned, by following that method, to interstate toll for the use of the subscribers' lines and equipment for each of the years 1923 to 1931.

I have also taken into account in reaching my opinion on this subject, in so far as they are involved, the rate schedules filed by the Illinois Bell Telephone Company, and the contracts made by the Illinois Bell Telephone Company with its subscribers under which these revenues were collected.

794 I did not examine the rate schedules themselves. I based my conclusion on the understanding that the rates for exchange service contained in the rate schedules covered the use of all of the exchange facilities and services fur-

795 nished to subscribers. I did not examine any rate schedule or contract. I had information as to what the

exchange rates for exchange service covered in the City of Chicago.

I thought it a matter of general knowledge among the officials of the Illinois Bell Telephone Company that the exchange rates covered the use of the exchange facilities for interstate service. My knowledge of this subject was gained from the officials of the Company. I discussed this question with
796 Mr. Cleveland, Vice President, Mr. Mapes, Chief Engineer, and Mr. Burgess, General Counsel for the Company. I do not think they were together when they gave me this information. I discussed it at various times with these
797 gentlemen. Perhaps I should also have mentioned the late Mr. Bangs. I think he was the gentleman with whom I first discussed the question; I think I discussed it with him before I testified in the former hearing. The next person with whom I discussed this matter was probably Mr. Cleveland. I could not be certain whether that was before the first hearing, but it possibly was. After that the discussion was, I think, general, with either of these gentlemen, together with Mr. Burgess and Mr. Mapes, or separately, or together. I am not sure that I was possessed of this information at a time prior to the time I first testified in this case.

798 I had access to the Company's Account 500, covering subscribers' station revenues; Account 501, covering public pay station revenues; Account 504, covering private exchange lines; and Account 505, minor rents of exchange plant. Mr. Kruse's work papers show how much has been apportioned to interstate toll from each of these accounts. I could not state in dollars how much has been apportioned to interstate toll from each of these accounts. The individual accounts are not shown in Mr. Kruse's exhibits.

799 My opinion that the exchange rate schedules cover the use of local plant in interstate toll service is based finally on the opinions given me by the gentlemen whom I have named, beginning with Mr. Bangs. The information which they gave me was that the rates for exchange service cover the use of the local exchange plant for all classes of service, including interstate service. I was never told by any of them

that the use of the local exchange plant for interstate service was free. I understand that there is no specific charge
800 in the exchange rate for the use of local exchange plant for interstate purposes. I was informed that the schedules for toll rates stated that the toll rate covered the use of toll facilities and services only, but I cannot remember when I was told that or who told me. That was information I obtained from one or the other of the officials of the Company. There was no year specified as to when this became true. I understood that that was a continuing situation during the period of the study.

I cannot assert definitely, but I think probably Mr. Bangs told me this in 1923. I was not told of any exchange
801 schedules or any schedules in relation to local exchange rates as containing any such provisions; no one ever told me that any such provision was made in the exchange schedules filed anywhere in regard to local exchange rates. It was my understanding that the exchange rate schedules made no reference to the matter. I acquired that understanding
802 some time in connection with the preparation of the previous separation studies filed in this case. I do not recall the source of that understanding.

I did not examine any contracts made with local exchange subscribers to determine whether they covered this matter in any way. I did not endeavor to obtain any information respecting that. I relied upon the statements of the officials of the Company that I have mentioned: I do not mean to say that they made statements in connection with these contracts.

803 I was informed that the contracts made no reference to this point. At that time, I was seeking to find out about it; I think I made the inquiry to get as much information on the subject as I could obtain. I had in mind that the contract with subscribers might have some bearing upon this question of separation, and that the rate schedules filed with the official body might also have some bearing.

804 I relied upon the information which I obtained from the officials of the Company, as to all of those matters

concerning which they could correctly inform me, as to what was contained in contracts with subscribers, or any other matters.

"Mr. Haight: In view of the fact that the testimony of this witness is based upon what has been told him by officials of the Company in regard to contracts covering this period 1923 to 1931, I move to strike out all the witness' testimony until such time as the plaintiff produces those contracts, and produces the schedules filed by it with the Illinois Commerce Commission, and its predecessor, during the years 1923 to 1931, both inclusive, because they are the best evidence.

"The Court: Do you expect to put them in?

"Mr. Thompson: Your Honor, may I answer that indirectly at first, and then come to it directly? This witness has said that he approved the apportionment made of the revenues and expenses on the basis of an understanding that it has always been the Company's practice to include in its exchange rate, pay for all services rendered by means of exchange facilities. Now, that is all that this witness has said.

"Now, on cross-examination Mr. Haight asked him first where he had received that understanding, whether he
805 had ever seen any rate schedules, whether he had seen the Company's contracts. Now, it is our position in this case that the question of whether exchange revenue should be taken out in part in this interstate separation depends upon the fact as to what those exchange rates were set up to include, and what they did include, and there will be substantial testimony in this case on that line.

"The Court: Well, on that statement I will permit the testimony to stand without prejudice to your right to renew the motion to strike later."

807 It is noted that on Wednesday, March 9, 1932, Judge Evans was sitting.

W. K. KRUSE, recalled as a witness on behalf of the plaintiff, having been previously duly sworn, further testified as follows:

Direct Examination by Mr. Thompson.

When I was on the witness stand last week, I gave the number of stations which had been lost by the plaintiff in its Chicago area in the months of January and Febru-
808 ary, 1932, and on the first day of March. I now have information on this subject up to and including the 6th of March. There were 1,858 stations lost in the Chicago area of the Illinois Bell Telephone Company during the first six days of March.

809 *Cross-Examination by Mr. Haight.*

In making the interstate separation about which I have testified on direct, I took out a part of the exchange revenues and placed that part in interstate toll revenues for each of the years 1923 to 1931, inclusive. The amounts so apportioned were:

In Account 500, for the year 1923, $324,606.33; 1924, $348,427.22; 1925, $412,544.54; 1926, $418,696.31; 1927, $463,533.40; 1928, $535,653.61; 1929, $592,103.64; 1930, $590,475.46;
810 and in 1931, 545,798.11.

In Account 501, the amounts apportioned were: 1923, $31,434.98; 1924, $35,205.92; 1925, $40,461.86; 1926, $41,408.41; 1927, $45,836.01; 1928, $52,837.82; 1929, $58,143.55; 1930, $58,138.19; and 1931, $55,391.30.

In Account 504, Private Exchange Lines, all of the revenues assigned to interstate toll are in connection with teletypewriter service, radio circuits and short-period talking
811 service. There was nothing assigned for the years 1923, 1924 and 1925. In 1926, there was assigned $632.53 in connection with teletypewriter service. In 1927, $1,972.67 in connection with teletypewriter service; $54.16 in connection

with some short-period talking service; and $3,661.97 in connection with radio service, or a total of $5,688.80. In 1928, teletypewriter revenues assigned to interstate were $2,073.80; short-period talking service, $63.25; for radio, $5,221.24;
812 or a total of $7,358.29. In 1929, for teletypewriter service, $2,042.33; for radio, $11,732.12; or a total of $13,774.45. In 1930, there was assigned for teletypewriter service, $2,630.11; for radio, $19,555.81; or a total of $22,185.92. In 1931, there was assigned only an item for radio, amounting to $20,631.35.

In Account 505, Minor Rents of Exchange Plant, there was only one year where any revenue was assigned to interstate. That was in 1923, when there was assigned to interstate toll the sum of $93,771.56, representing a portion of the originating commissions received on A. T. & T. messages during that year.

In Account 500, there were some other items in connection with long distance terminals assigned to interstate toll,
813 as follows: In 1923, $4,727.82; in 1924, $4,016.53; in 1925, $3,724.16; in 1926, $3,634.33; in 1927, $3,923.80; in 1928, $4,095.70; in 1929, $4,723.09; in 1930, $5,528.82; and in 1931, $5,984.57.

There is one more item in Account 500, which represents the revenue in connection with interstate foreign exchange service. For this item, there were assigned to interstate toll the following amounts: for 1923, $26,621.72; 1924, $29,863.70; 1925, $31,099.65; 1926, $31,424.97; 1927, $34,718.49; 1928, $38,398.71; 1929, $42,051.03; 1930, $39,169.63; and for 1931, $37,385.40.

814 I made these apportionments based on my understanding that the exchange rates compensate for all uses made of the exchange facilities, both interstate and intrastate, which fact is a matter of common knowledge in the general offices of the Company. I perhaps originally got this
815 information from my immediate superior, who, at that time, would have been Mr. U. F. Cleveland, General Auditor. It would be rather difficult to say when I first got this information, but I think I can safely say it was back at

least as far as 1923, when this case was first started. At that time I was assisting Mr. Cleveland in making the separations in connection with the former hearings in this cause. The information which he gave me was oral and not in writing.

To a certain extent, it was in dependence upon that that I have made the separation that I have described, and, to a certain extent, it was based on my contacts with other
816 men in the Company. The matter was discussed at some time, I believe, with the General Manager, Mr. Kurtz. I could not say just when, but I feel that it would have been under discussion with him at some time or other. I have a very definite picture in mind of having discussed the matter with him since the Supreme Court entered its decision in this case, which would have been some time in the early part of 1931. We had a discussion at that time, not only on that particular subject, but the entire separation; I think this was after I made the separation.

817 I received instructions from Mr. U. F. Cleveland, Vice-President, to make a separation on a station-to-station basis. I do not remember the exact date of these instructions, but I would say it was either in the latter part of December, 1930, or in the early part of January, 1931. These instructions were not in writing. I did make such a separation, which was introduced in evidence in this case. It was on the basis of those instructions which Mr. Cleveland gave me that I proceeded.

I actually prepared Plaintiff's Exhibit A-48. When I
818 prepared it, I think I had consulted with Mr. Cleveland and others. I believe I also consulted concerning this exhibit with Mr. A. B. Crumden, Assistant Comptroller of the American Company, and had some discussions with Mr. Mapes, Chief Engineer. I would say that the majority of these discussions were had during the time involved in separating the revenues and expenses. I do not think that I had had any consultation with any of these gentlemen when I began making the separation that was finally embodied in

the exhibits that were identified by me on direct examina-
819 tion. I was instructed by Mr. Cleveland to go ahead and
I did so. No one else gave me any instructions. Before
I went ahead with the separation, I was not directed by any-
one to make the separation of the revenues in the way I have
done in these exhibits. The only instructions given me by
Mr. Cleveland were to proceed with a separation on a station-
to-station basis. I think those were all the instructions I had
from him.

I did not consult any rate schedules or contracts with the subscribers. The separation was based principally on my understanding that the exchange rates covered interstate and
intrastate uses of the exchange facilities. The only way
820 that I took the rate schedules into consideration was
based on my understanding of what those rates covered.
I said that I did not consult the contracts or schedules.

"Q. But you must have—you said it was based upon your understanding of those schedules and contracts. Did you get that from the air, or from the documents?

"Mr. Thompson: To which question the plaintiff objects, because the witness did not say that it was based upon his understanding of those contracts and schedules, but was based upon his understanding of what the exchange rates were intended to, and did, cover—that is, all services rendered by means of exchange facilities.

"Judge Evans: You may answer that question, as to your understanding. What was your understanding?

821 "A. No, sir. As I mentioned before, it was based on my discussions with Mr. Cleveland and others, as to what those rates covered."

It was based upon my understanding of what the rates covered. I have never seen the schedules. If I said that it was based upon my understanding of the schedules, I really meant the rates; what the exchange rates covered. I think the words "rates" and "rate charges" are synonymous.

If I should undertake now to find out what the rates were,
I would look at the rate schedules on file with the Illinois
822 Commerce Commission. I have not done this in respect

to this separation, nor have I examined any contracts or schedules for any of the years 1923 to 1931, inclusive, neither did I consult the bills to the subscribers for services rendered.

The understanding upon which I proceeded was not an understanding based upon any examination of schedules or any contracts or bills rendered to the subscribers for service. I had an understanding in respect to those matters based upon my discussions with Mr. Cleveland and others. In the discussions I had with Mr. Cleve-
823 land or others, no copies of the schedules of the Company, nor of its contracts, nor of its bills rendered to subscribers, were brought into them. I do not know whether any of these things were taken into consideration by the others when they discussed the matter with me. The contents of any of these contracts, schedules, or bills were not mentioned in any of these discussions.

828 I do not know as a matter of fact whether the document appearing as Plaintiff's Exhibit 8, as printed in the Supreme Court record, transcript of record, Volume IV., page 1222, which bears the letters "I. P. U. C. No. 1, Sheet No. 3," and the sheet on page 1224 of that record, headed "I. P. U. C. No. 1, Sheet No. 7." were issued by the Illinois Bell Telephone Company on December 27, 1920, and on October 31, 1922, respectively, effective January 1, 1921, and December 1, 1922, respectively, and were filed with the Commission before their effective dates. According to the exhibit, these rate schedules were filed by our General Commercial Superintendent, who, at that time, was Mr. A. R. Bone. He is the official who has charge of the filings in our Company; that is one of his responsibilities. That is a responsibility of that official and has been back to and including 1923. Mr. B. R. Cooper holds that position now, and has, I think,
829 since 1928 or 1929, and he was preceded by Mr. Bone, who runs back to a time prior to 1923.

830 I did not prepare the document marked Defendants' Exhibit D-12 for identification.

(Mr. Thompson stated that Exhibit D-12 was furnished defendants by plaintiff.)

834 If the rates shown in I. P. U. C. No. 1, Sheets Nos. 3 and 7, appearing in Plaintiff's Exhibit 8, and regulations shown in I. P. U. C. No. 1, Revised Sheet No. 2, and Original Sheet No. 2, are all of the effective rate schedules during
835 the period 1923 to 1931, we have assigned to interstate toll, based upon the use of the exchange facilities, a part of the revenue collected under those schedules.

(Pages 5 to 14 of the Chicago Alphabetical Telephone Directory of 1931-1932 were marked for identification as Defendants' Exhibit D-13.)

836 (A document purporting to be a photostat taken from the Chicago Alphabetical Telephone Directory for 1923, was marked for identification as Defendants' Exhibit D-14.)

838 I took out a portion of the exchange revenues and placed that part in intrastate toll revenues in making my separation. The amounts so apportioned were as follows:

Account 500, in 1923, long distance terminals,
839 $2,839.11; exchange revenues for use of exchange facilities, $600,521.71; total, $603,360.82. In 1924 long distance terminals, $2,500.64; subscribers' lines, $686,505.13; total, $689,005.77. In 1925, long distance terminals, $2,071.30; subscribers' lines, $791,938.18; total, $794,009.48. In 1926, long distance terminals, $2,161.13; subscribers' lines, $924,291.86; total, $926,452.99. In 1927, long distance terminals, $1,806.05; subscribers' lines, $1,036,629.23; total, $1,038,435.28. In 1928, long distance terminals, $1,634.15; subscribers' lines, $1,160,582.81; total, $1,162,216.96. In 1929, long distance terminals, $1,626.86; subscribers' lines, $1,279,707.87; total, $1,281,334.73. In 1930, long distance terminals,
840 $1,9[illegible]3.50; subscribers' lines, $1,348,972.39; total, $1,350,908.89. In 1931, long distance terminals, $2,175,46; subscribers' lines, $1,197,980.61; total, $1,200,156.07.

Account 501, for use of subscribers' lines for 1923, $58,154.72; 1924, $69,366.11; 1925, $77,672.32; 1926, $91,411.01; 1927, $102,505.99; 1928, $114,481.96; 1929, $125,665.09; 1930, $132,819.76; 1931, $121,579.22.

Account 504, private line stations for 1923, $99.00; for

1924, $99.00; and for 1925, $108.00. For 1926, private line stations, $216.00; teletypewriter service, $1,247.37; short-
841 period talking service, $21.00; total, $1,484.37. For 1927, private line stations, $171.00; teletypewriter service, $3,509.52; short-period talking service, $83.58; total, $3,764.10. For 1928, private line stations, $180.00; teletypewriter service, $5,491.76; short-period talking service, $169.38; total, $5,841.14. For 1929, private line stations, $297.00; teletypewriter service, $6,660.09; total, $6,957.09. For 1930, private line stations, $450.00; teletypewriter service, $10,224.44; total, $10,674.44. Nothing was apportioned in this account in 1931.

In Account 505, 1923 was the only year in which anything was assigned, and the amount of $11,898.44 represents a part of the originating commissions received on A. T. & T. messages and report charges originating in Chicago.

I received the same instructions with relation to the separation of intrastate toll as I did with relation to inter-
842 state toll. The same discussion with regard to interstate toll would apply fully to the intrastate toll separation.

Exhibit 13, appearing on page 1271 of Volume IV. of the transcript of record in this case before the Supreme Court, which is entitled "Ill. C. C. No. 2, Revised Sheet No. 2, Cancelling Original," issued September 1, 1926, and effective October 1, 1926, is a schedule which apparently refers to the intrastate toll service of the Illinois Bell Telephone Company. There is no reference made specifically to intrastate toll, but it was filed with the local Commission, and I
845 assume applies to intrastate toll. The understanding upon which I made the separation, as to what the exchange rate charge covered with reference to local toll, was based upon the discussions which I have heretofore
846 described. The amounts billed to subscribers were in accordance with the approved effective rate schedules on file with the Commission, but my understanding is that those revenues which I have apportioned from exchange revenue to interstate toll and intrastate toll compensate for the use of exchange facilities for intrastate and interstate toll use. The billings in those cases were based upon the rates set up in

the local exchange schedules. As far as revenues and expenses are concerned, the separation which I made of them to interstate toll service included long distance service of the A. T. & T., the Illinois Bell interstate service to Indiana, and the connecting company interstate toll service of the Illinois Bell.

847 I think an apportionment of the revenues, expenses and property allocable to the long distance service of the A. T. & T. in Chicago could be made along the same lines which we have followed in this particular separation which I have made. It would be merely breaking down the interstate items between long lines and others. It would be, however, a rather enormous task, and I am afraid it would

848 take me, with quite a large force of people, a rather long time. After the property had been separated, it would take at least a month for a crew of five or six people to so separate the revenues and expenses. I think that is a very conservative estimate. Before the revenues and expenses could be separated, I would have to wait until the property had been separated. I do not know how long it would take to separate the property.

849 *Re-direct Examination by Mr. Thompson.*

Accounts 500, 501, 504 and 505 are all revenue accounts. Account 500 includes revenues billed for use of exchange facilities, involving stations at subscribers' premises. Account 501 includes the revenues collected from public pay stations for the use of exchange facilities. Account 504 includes the revenue from private exchange lines, and Account 505 covers minor rents of exchange property. I stated on my cross-examination that I had considered as interstate toll revenue for the year 1923, the sum of $93,771.56, which

850 represented a portion of the originating commissions received on A. T. & T. messages and report charges originating in Chicago. I also stated that no sum was included under this Account 505 during any of the other years by reason of the fact there was a change in the accounting

for this particular item, effective January 1, 1924, whereby they have been treated in the Toll Revenue Account 510. This is the reason why this item does not appear in the particular revenue accounts which I have been discussing. I was just furnishing details of the amounts in Account 505 which are apportioned to interstate toll, and those amounts since 1924 appear in Account 510.

851 Long distance terminal is a service furnished to certain subscribers who wish to have it. It permits them to have conections direct with the toll board on toll calls without going through the local switchboard. A portion of the revenues from these long distance terminals was apportioned by me to interstate and intrastate revenues in my separation exhibits. The revenue for the use of the instruments and the lines connecting the instruments to the board in the case of long distance terminals is in the 500 account. The amounts which we bill for messages is in the 510 Toll Revenue Account.

852 CARROLL O. BICKELHAUPT, called as a witness on behalf of the plaintiff, having been first duly sworn, was examined and testified as follows:

Direct Examination by Mr. Thompson.

My name is Carroll O. Bickelhaupt. I live in New York City. At this time I am Assistant Vice President of the
853 American Telephone and Telegraph Company, with which Company I have been connected from the time of my graduation from the University of Wisconsin, in 1911, continuously down to the present time, except for a period of five and a half years, when I was associated with the Southern Bell Telephone Company.

The first telephone experience that I had was with the Dakota Central Telephone Company, in Aberdeen, South Dakota. I went to work there as a messenger boy in 1904. That Company is not owned, and never has been owned, by the Bell Telephone System.

I first went to work for the American Company in 1911, as a junior engineer. Shortly thereafter I became toll rate engineer, and later on, toll traffic engineer, and finally, in 1922, I became commercial engineer. I left the Company in
854 1925 to go to the Southern Bell Telephone and Telegraph Company. I was elected Vice President in charge of operations of the Southern Bell Telephone and Telegraph Company and the Cumberland Telephone and Telegraph Company, January 1, 1925. The Cumberland Company went out of existence in 1926, but I was with the Southern Bell Company until May, 1930, at which time I became Assistant Vice President of the American Telephone and Telegraph Company.

During my connection with the American Telephone and Telegraph Company, I had experience in connection with the making of rates for telephone service, including those commonly called exchange rates, and those commonly called toll rates. In fact, most of my work with that Company from 1911 to 1925, had to do with rate and associated matters.

During that time I was familiar, and am now familiar, with the rates and rate practices of the American Telephone
855 and Telegraph Company, and of the various Bell associated companies, including the Illinois Bell. During the time that I was in the commercial engineering division of the American Company, and during the time I was at the head of that division, I made studies with respect to the effect of various rate treatments upon telephone revenues, expenses, traffic, etc.

As I said, I was the commercial engineer of the American Telephone and Telegraph Company. The commercial division of the Department of Operation and Engineering of the American Company, studies, among other things, rates, rate practices, tariffs; it furnishes consulting advice to the associated companies along those lines, and also with respect
856 to commercial practices. While commercial engineer of the American Telephone and Telegraph Company, I frequently consulted with the various Bell associated companies, including the Illinois Bell, on rate and tariff questions.

As Operating Vice President of the Southern Bell Telephone and Telegraph Company, the rate making of that Company was under my direction. The Southern Bell Telephone Company does now, and it did during my connection with it, operate in 9 southern States. These States are: North and South Carolina, Alabama, Georgia, Florida, Tennessee, Kentucky, Mississippi and Louisiana.

I have studied and am familiar with the principles covering the making of rate schedules and the actual manner in which they have been made in the Bell System, including not only the American Telephone and Telegraph Company,
857 but the associated Bell telephone companies. I am also familiar with the facts as to the historical development of telephone service by telephone companies generally in the United States, and as to how rates and rate practices applicable to exchange and toll service have been developed.

Originally, telephone service was furnished over lines permanently connecting a pair of telephones. These lines were essentially what we now think of as private lines. The telephones connected to these lines were ordinarily located in the home or business place of a customer, or the lines connected places of business of associated business enterprises.
858 At first there were no telephone exchanges as we now know them, but within a very short time exchanges were established to permit the inter-connection of the lines used by customers for telephone service.

Exchange service only was furnished by these early telephone exchanges. The rates for this early exchange service were usually flat monthly or annual rates, which entitled the subscribers to the exchange service to connection with any other telephone in the exchange.

At the beginning of the telephone industry, there were no inter-city or inter-exchange lines. The first inter-city lines were established, however, fairly shortly after the telephone business commenced. These inter-city lines and the exchange systems then existing were not connected in any way. In the beginning, the inter-city lines teminated in telephones, or long distance offices, and anyone desiring to use them had to go,

to one of these offices and pay the rate for the use of the inter-city line, in accordance with whatever tariffs or
859 rates were then established.

Shortly after inter-city lines began to be established, arrangements were developed for connecting them into the telephone exchange switchboards. This made it possible for the subscribers to the telephone exchange service to use these inter-city or long distance facilities without the necessity of going down to the long distance office to talk. In other words, they could talk from their own telephones.

It also happened that these inter-city lines were extended into small towns where no exchanges existed. In that case they were terminated in telephone instruments which were referred to, and have always been referred to since, as toll stations.

"Q. Now, how were the toll rates applied when someone desired to talk over these inter-city lines to one of these toll stations?"

Defendants object; overruled.

860 "A. A subscriber to a telephone exchange, to telephone exchange service, who desired to talk to a toll station in a distant town, paid a certain rate for that long distance message. Now, anyone who desired to talk in the reverse direction from the toll station in this given town back to the same exchange and to a subscriber in that exchange, paid exactly the same toll rate."

Telephone companies still have toll stations today.

In many cases, the demand arose for a more complete telephone service in many of the smaller towns which had previously been served by the toll stations only. In such cases, the telephone company canvassed the towns, secured lists of subscribers, and constructed exchanges.

861 "Q. What do you have to say as to the rate procedure which was followed in such cases?

"Mr. Haight: May it be understood, if your Honor please, that our objection made to this line of testimony may stand to the entire line?

"Judge Evans: It is only a background for the question

of construction. It has no direct bearing, but it shows how the thing got started.

"Mr. Haight: Well, for that purpose, of course it is quite all right, but I did not want my objection to be waived to any evidence, on the ground that the objection had not been made.

"Mr. Thompson: I think it has, if the Court please, a very direct bearing, not only from the historical standpoint, but as to how these rate structures have been built up and developed, and what they cover today.

"Judge Evans: The testimony will be received. The objection will be noted as though it was taken to all of the testimony."

A schedule, or set of exchange rates, was established for this new exchange, and applied to all the subscribers secured. The toll rate between this exchange and other exchanges re-
811 mained just as it was prior to the time when the exchange
862 was constructed, and when the town was served only by a toll station. There was no difference in the amount paid for a toll message as between a person who was a subscriber to the exchange and one who was not.

My principal duty in the first job I had, was as a messenger for the purpose of notifying people that they were desired to answer telephone calls. It was my job to go and call people to the telephone when someone wanted to talk with them. A collateral job was when I would call the same man to the telephone several times. I would take a contract out to him and try to get him to subscribe to our service. When I succeeded in getting a man to subscribe to our service, he paid the exchange rates of this particular town (Aberdeen, South
Dakota) and he paid the regular toll rate if he used the
863 toll facilities. Those toll rates were exactly the same, as far as he was concerned, as what he had paid when he had had to walk down to the office and make his call.

The local exchange rate entitled the subscriber to connection with any telephone connected to the exchange, including connection with the long distance switchboard, the information operator, repair clerk and telephone company's business office.

This method of establishing rates has prevailed throughout the telephone industry down to the present time.

864 It has been the general practice of telephone companies throughout the United States to separate or classify the telephone service into exchange service and toll service, and to charge separate rates for each class of service. When a subscriber pays his exchange rates, he is entitled to exchange service, which has always included the right or privilege of connection with the other telephones connected with the same exchange, including the right to call or be connected with the toll or long distance board, in order to send or receive toll and long distance messages which come over the toll facilities. When toll lines are connected with exchange lines, the subscriber who pays the toll rate for a given toll call is entitled to the use of toll facilities.

Usually in connection with a toll call, both exchange service and toll service are required. The patron pays for the use of the toll facilities by payment of the toll rate, and he pays for the exchange service that is required in connection with

865 the toll call through payment of his exchange rates. This method of establishing rates has prevailed since the beginning of the telephone industry and prevails today.

The exchange rate covers every use made of the exchange telephone, just as it did at the beginning of the telephone industry. That has always been so in all of the telephone industries with the possible exception of New York where special conditions prevail with respect to the local toll service.

The purpose of a telephone exchange is to furnish all connections within the exchange area. When a connection is made with the toll systems, it is made within the exchange area by means of exchange facilities which are there for the purpose of affording all connections within that exchange area. The Bell System, and the associated companies, have built up their telephone service on this basis.

866 I have before me Supplement No. 2 to the May 1, 1917, issue of the Tariff and Route Book of the American Tele-

867 phone and Telegraph Company, issued effective June 1, 1917. This contains the following:

"This Tariff and Route Book, together with the Rate Sheets described below and all Supplements as issued, constitutes the American Telephone and Telegraph Company's tariff for telephone toll service.

"The service covered by this tariff consists in furnishing for the use of patrons facilities, other than exchange facilities, intended for use in telephonic communication between the points listed. The exchange facilities used in connection with this service are the facilities required to establish connection between an exchange station and the toll board, or between an exchange station and the toll trunks, when such trunks are employed to effect connection with the toll board, and the
868 use of such facilities is covered by the charges for exchange service."

869 (Plaintiff offered a document identified as Plaintiff's Exhibit A-66 in evidence. This consisted of a certified copy of the first three sheets of the Tariff and Route Book of the American Telephone and Telegraph Company, filed with the Illinois Commerce Commission, effective August 1, 1917; the right to reserve objections was granted to the defendants by the Court.)

870 The same provisions hereinabove quoted are contained in the present tariff of the American Telephone and Telegraph Company.

871 There is a similar provision in the license contract of the American Telephone and Telegraph Company and the Illinois Bell Telephone Company, dated September 25, 1930.

872 (Defendants objected to an instrument identified as Plaintiff's Exhibit A-67, containing certified copies of certain tariffs filed by certain of the Bell associated companies with the Public Service Commissions of various
874 States, as being immaterial. That exhibit was received in evidence for the limited purpose of corroborating or explaining the meaning of the term "exchange service.")

875 The instrument identified as Plaintiff's Exhibit A-68 contains certain filings made by companies not associated with the American Telephone and Telegraph Company with

the Public Service Commissions shown in the particular filings.

(Plaintiff offered in evidence Exhibit A-68. Defendants objected thereto as being immaterial. Exhibit was admitted in evidence for the limited purpose of corroborating or explaining the meaning of the term "exchange service.")

876 The instrument identified as Plaintiff's Exhibit A-69, which bears on the outside of it the legend "Traffic Agreements with Connecting Companies", contains copies of agreements between certain Bell associated telephone companies and their connecting companies. The first contract included in this exhibit is that of the New York Telephone Company, currently in use, but I don't know how long it has been in use. The second one, entitled "Exchange and Toll Line Agreement", has been in use in the State of Arkansas since 1921, as has likewise the third, entitled "Exchange Agreement". The fourth contract, which bears the inscription "Form S-8615 a-T", has been used in the State of Texas since 1923, as has likewise the next contract. The last con-

877 tract in the exhibit is one between the Michigan Company and one of its associated companies. I am not sure how long it has been used, but this is a copy of a contract which has actually been executed and it bears the date of November, 1924.

(Plaintiff offered in evidence Exhibit A-69. Defendants objected on the ground that it was immaterial. It was received in evidence for the limited purpose of corroborating or explaining the meaning of the term "exchange service.")

879 I have made studies to determine what percentage of the exchange subscribers use the toll service of a given company. During the time I was associated with the Southern Bell Company, the General Auditor of that Company used to furnish me with current statistics on that subject.

"Q. Will you state just generally what that usage is?"

(Defendants objected on the ground of immateriality. Objection overruled.)

881 These studies indicated that during any one month, from 50 to 60 per cent of all subscribers to a given exchange make use of the toll service in originating toll and

long distance business. While I have never made any such studies myself, I have seen data showing the use that subscribers make of this toll service during a year, and that runs considerably higher. The studies that I have seen indicate this use would run from perhaps 85 to 90 per cent of all subscribers. This is based on originating calls, and has no reference to the amount of toll traffic received.

882 (Defendants moved to strike out entire answer and the reference to "studies I have seen." Motion was denied.)

"Q. Do the exchange rates of the Illinois Bell Telephone Company give to subscribers for exchange service, the privilege of connection with the toll system as a part of the exchange service paid for in the exchange rates?

"Mr. Haight: I object to that. The schedules speak for themselves. There is no other vocalization to be had on that question. This witness' opinion or judgment or statement is not only immaterial, it is utterly uncalled for.

883 "Judge Evans: I haven't any objection to the answer. To me it is self-evident. But I assume his answer is yes.

"Q. What is your answer?

"A. Yes."

Cross-Examination by Mr. Goldstein.

887 As toll rate engineer of the American Company, my principal duty was to study the experience of the Bell System on the various systems of toll rates as they applied throughout the country; to investigate the advantages and disadvantages of various kinds of schedules; to put myself in a position to be able to estimate revenues under various toll schedules; to furnish consulting advice with respect to toll rate matters to the associated Bell telephone companies; and to give the associated companies such services as they requested in connection with such matters. As commercial engineer I had those same duties, which were performed under my direction. I also had the responsibility for exchange rate matters and for commercial practices—and by that I mean, the collection practices, billing practices, management of telephone business offices, telephone directory matters, connecting

company arrangements as far as they went into the commercial phases of the business; and there again my duty was to study these matters, and put myself in a position to render consulting service to the associated companies, and I did
render consulting service on these matters.

888 To acquire the information as to the manner in which rates were established, and the manner in which they should be established, I started from what was actually the practice of the various associated companies. I ascertained the practices of the companies in various ways, by going out and talking with them, by correspondence, or by their coming in to see me. I found out what the practice of all the companies was at the time I was working on that job. I secured substantial quantities of data from the associated companies which would permit me to determine the effect of various types of rate schedules on traffic, for example. I have had the data that were in the possession of the Amer-
ican Telephone and Telegraph Company as to how the
889 rates were established. That is historical.

My first information, with respect to toll rates, was secured along about 1913, if I remember correctly. At that time my superior, who was then the Commercial Engineer, called a conference of the officers of the various Bell telephone companies at which we discussed for several days the toll rate schedules. Included in this discussion were questions of how these schedules were established and whether they were effectively meeting the requirements of the existing situation. I attended this conference and learned a great deal from these discussions.

I think I have seen contracts between the American Telephone and Telegraph Company, or its predecessor, the American Bell Telephone Company, and the exchange licensees, or
with the licensees covering extra-territorial service. I
890 assume that those contracts are in the possession of the American Telephone and Telegraph Company. I do not think I ever asked the Secretary of the American Company to provide me with any specific contract of that nature. In

visiting the associated companies, I have seen their end of the same contracts from time to time.

I am not sure that any of these contracts make provisions for the basis upon which exchange rates or toll rates should be established; I would have to examine the contract to determine that. Undoubtedly, these contracts contained provisions which had a bearing upon the effect in the establishment of exchange rates and toll rates. These contracts provided, among other things (at least the ones I have seen did), for an inter-connection between the toll lines owned by the American Bell or the American Telephone and Telegraph Company and the exchange system of the other companies. I assume that in these contracts are provisions relating to the compensation from the toll line company to the exchange company for certain services which the exchange company performs for the toll line company, which services are in the nature of toll service which the toll line company is hiring some one else to do for it. I am sure that is the case from the several I have seen.

892 If there is a connection contemplated under the exchange contracts, there certainly would be some terms under which such a connection would be made, but I do not know.

I believe I have a copy of the license contract of the Illinois Bell Telephone Company, and I am familiar with it to a certain extent; the contract to which I am referring is the one dated September 25, 1930. I am also familiar with the memorandum of agreement between the American Company and the Chicago Company, dated February, 1919.

893 I have seen contracts between the Chicago Telephone Company and the American Telephone and Telegraph Company dated prior to 1919, but I do not know that I am familiar with all the terms. I probably have seen copies of the forms of contracts used by all of those companies of the Bell System whose tariff provisions as to toll service are described in the Exhibit A-67. I, of course, cannot carry in mind just exactly what those contracts state. I probably have seen most of the contract forms used in providing for

inter-connection between the systems of independent telephone companies and the companies referred to in Plaintiff's Exhibit A-69.

894 I am sure I have seen the license contract between the American Company and the Southwestern Company. I don't know whether I have ever seen the contract between the American Company and the Michigan Bell Telephone Company, but I am quite sure I have seen the contract between the American Company and the New York Telephone Company.

895 I am not familiar with the forms of exchange and toll license contracts between each of the companies whose tariffs are described in Exhibit A-67, and the American Bell Telephone Company, or the American Telephone and Telegraph Company. I am, however, familiar with the license contract between the American Telephone and Telegraph Company and the Southern Bell Telephone and Telegraph Company.

It is hard for me to say whether or not the contracts with which I am familiar are the current contracts now existing, or contracts which are superseded by the present con-

896 tracts. From time to time in the last twenty years, I have had occasion to consult these contracts. During the last seven years I have only been with the American Telephone and Telegraph Company a little over a year and a half, and whether new contracts have been written since I have seen the old ones, or not, I am not sure. I do know about the Southern Bell, however.

In a general way I am familiar with the form of contract that has existed between the Southwestern Bell Telephone Company and the American Bell.

Forms of contract between the Southwestern Bell and the American Bell Telephone Company which have been reproduced as Defendants' Deposition Exhibit 192, and are shown in the record of the so-called Houston Case, appearing in 259 U. S. 318, being forms 109-D, 113-D and 116-C, are

897 not the forms of contract with which I am familiar. The contract that I referred to as being more or less familiar

with, is a contract executed some time around 1925 or 1926. I do not know the exact date, but I was negotiating a similar contract on behalf of the Southern Bell with the American Company, and I looked at the terms of a recently executed contract of the Southwestern Bell in connection with my own negotiations. I am not familiar with the provisions of the contract which existed between the Southwestern Bell and the American Company prior to 1925.

898 In my experience, the American Company did not have a form of contract for exchanges, but made a contract with the associated Bell companies that covered both exchanges and toll lines, and which provides for the inter-connection of the whole system. There was no specific contract with reference to exchanges.

I am not familiar with the form of contract known as Form 109-D, entitled "Contract for Exchanges."

899 I do not believe I have ever seen the contract Form 109-D between the American Bell and the Southwestern Telegraph and Telephone Company, dated July 27, 1889, and appearing as part of Defendants' Deposition Exhibit 192. I cannot say that I have ever seen the form of contract known as Form 113-D, entitled "Contract for Extra-territorial Connecting Lines." I have seen similar contracts, but whether they were contract Form 113-D or not, I do not know. I do not know whether or not this Form 113-D was used with any company other than the Southwestern Bell. I have never

900 seen a contract containing the same terms as Form 109-D. I do not know that I could even say that I had seen a contract with substantially the same terms. I do not believe that I have seen exactly or substantially the same phraseology contained in Sections 7, 8 and 9 of that form of contract (Form 109-D).

901 Over a period of years ending in 1925, I have been consulted on numerous occasions by representatives of the Illinois Bell Telephone Company with reference to the making of rates for telephone service, including those commonly called exchange rates. These consultations go back probably to 1912 or 1913, and had reference to a good many

things; it is hard to state the nature of the subject matter. With reference to exchange rates, the subject would have to do with service connection charges, the effect of various types of message rate schedules, coin box schedules, and so forth.

902 I think I have seen the contract dated November 10, 1879, between the Western Union Telegraph Company and the National Bell Telephone Company, which appears in Vol. VI., page 1887, of the Supreme Court printed record of this case as City's Exhibit 22. I am not familiar with it. It is a long contract and I think I have seen it, but I do not know all of those terms. I do not know that I have read it all through but I have read parts of it. That contract, as I remember it, was largely the granting of licenses under patents.

903 The contracts had to do with the granting of licenses for the use of telephone instruments, because the patents were still running at that time. I understand from my rather cursory examination of the contract that the Bell Telephone Company was to construct an exchange in Chicago.

904 I am not familiar with the contract shown as City's Exhibit 22, dated November 10, 1879, between the Western Union Telegraph Company for itself and for the Gold & Stock Telegraph Company, the American Speaking Telephone Company, and the Harmonic Telegraph Company, as parties of the first part, and the National Bell Telephone Company, as party of the second part. I have never read that contract. I have seen the contract dated December 23, 1881, between the American Bell Telephone Company and the Chicago Telephone Company, which appears as City's Exhibit 23, in Vol. VI., page 1925, of the Supreme Court printed record, but I would not say that I am familiar with it. It is a matter that I would have to study at considerable length before I could claim familiarity with it. I have read that provision of that contract appearing in Section 2, on page 1925 of the Supreme Court printed record, which reads as follows:

"The Licensor [being the American Bell Telephone Company] hereby grants and licenses to the party of the

second part [being the Chicago Telephone Company] the
905 full and exclusive right within and for all of the territory hereinafter defined, to use, and to license others to use, for all purposes for which the Licensor has or shall have the right to use them (except so far as the party of the first part to the contract of November 10, 1879, between the National Bell Telephone Company/the predecessor of the American Bell Telephone Company/of the one part and the Western Union Telegraph Company for itself and associates of the other part, may have a right under Article 14 of said contract to acquire from the Licensor telephones for transmitting telegraph messages and for use in private lines with the right to sub-let the use thereof along with such private lines, and except as hereinafter provided) telephones furnished by the party of the first part, embodying any invention in or relating to telephones or their use which the party of the first part now has or shall have the right to use, either under any Letters-Patent which it now owns or may hereafter acquire, or under any license or other grant or right
906 which it has acquired or may hereafter acquire under or by virtue of the contract of November 10, 1879, or otherwise, including such full and exclusive right as aforesaid to use such telephones on exchanges as defined in said contract last named."

I take it that that is a patent license. It has all of the terms that are usually included in a patent license. I am not familiar with the scope of the license granted by Section 2, because it refers back to a prior contract with which I am not familiar. I have seen Section 10 of the same contract as it appears in the Supreme Court printed record at page 1929, which reads as follows:

"In case the Licensor, its successors, or grantees shall desire to connect points within said territory, with points outside of said territory they shall have the right to connect with or avail themselves of the lines and facilities
907 of the party of the second part or its Licensee, owners of exchanges of public lines making a reasonable and

suitable division of the tolls and profits of such extra-territorial and through business; and if or so far as said Licensee or its sub-licensees shall not have or shall not furnish suitable lines and facilities then said American Bell Telephone Company may within said territory construct such lines and use such telephones as may be necessary for such purposes."

The contract of July 1, 1891, between the American Telephone and Telegraph Company and the Chicago Telephone Company, appearing in Vol. VI., page 1934, of the Supreme Court printed record, being City's Exhibit 24, appears to be a contract for services. It is rather special in its nature, and I am not familiar with it. It is not the type of general contract.

908 I have never seen the letter dated January 7, 1896, appearing on page 1938 of the Supreme Court printed record, being City's Exhibit 25, nor the letter dated January 15, 1896, appearing on page 1939 of the Supreme Court printed record as City's Exhibit 26.

I have never seen the letter of the American Telephone and Telegraph Company of June 14, 1899, appearing on page 1940 of the Supreme Court printed record, being City's Exhibit 27, nor the calculation reproduced on page 1940 of the Supreme Court printed record as City's Exhibit 27-A. I have never seen the document reproduced as City's Exhibit 28, on page 1941 of the Supreme Court printed record, entitled "Simplifying Accounts"; nor the letter dated May 11, 1909, from 909 the American Telephone and Telegraph Company to the Chicago Telephone Company, appearing on the same page as City's Exhibit 29. I take it that all these letters had to do with the administration of prior contracts, and are quite usual. I would not have had any opportunity of seeing them unless I particularly looked them up; I have never seen them.

I have never seen the document reproduced as City's Exhibit 30, on page 1942 of the Supreme Court printed 910 record; nor City's Exhibit 31, on page 1943 of the record. With the possible exception of Mr. Thayer's letter to

Mr. Sunny of May 28, 1920, being City's Exhibit 40, appearing on page 1977 of the record, which I may have seen as I was closely associated with Mr. Thayer's office, I have not seen the documents appearing on pages 1971, 1972, 1976, 1978 and 1979 of the record.

I have seen the ordinances of the City of Chicago under which the Chicago Telephone Company or the Illinois Bell Telephone Company has been operating during its exist-
912 ence. Specifically, I have seen an ordinance dated about 1881, the ordinance of 1907 and the ordinance of July, 1931. I think that when I referred to the ordinance of 1881, I had in mind the ordinance authorizing the Chicago Telephone Company to construct, maintain and operate lines of telephone wires, passed January 4, 1889, and accepted January 10, 1889. I think 1889 is the date (which said ordinance
913 was marked for identification as Defendants' Exhibit D-15). I have seen the 1907 ordinance (which was thereupon marked for identification as Defendants' Exhibit D-16). I have seen the ordinance of 1931 (which was marked for identification as Defendants' Exhibit D-17).

I do not know that the Chicago Telephone Company made any attempt to have the exchange rates in Chicago cover the use of local exchange property in long distance service,
914 beginning with 1893. My conclusion is that they always did it that way. I am not familiar with any litigation concerning this question, but I think the Chicago Telephone Company included, as one of the things which the subscriber who paid exchange rates was entitled to, the use of the exchange plant for reaching toll facilities in making toll and long distance calls. The exchange rates of the Illinois Bell Telephone Company and its predecessor companies, as far back as I have knowledge of them, entitled anyone who paid
915 those rates to communication with all telephones in the City of Chicago, and also entitled the subscriber to the use of those lines in getting access to the toll facilities, both of the Illinois Bell Telephone Company and of those other companies with which it had made contracts for the benefit of its customers.

I have been in the telephone business since 1904. When I was in college, between 1907 and 1911, I frequently came to Chicago. At those times I made use of the telephones in Chicago and thereby gained my knowledge that at that time that is the way the service was charged for. My knowledge of the Chicago Telephone Company starts, therefore, from the period between 1907 and 1911.

916 I have drawn conclusions of the practice prior to 1907 from my examination of the contracts of the Illinois Bell that I have had access to. I have seen a good many old contracts that the Illinois Bell Telephone Company made at different times with different customers, and I saw nothing in those contracts inconsistent with my conclusions. It is impossible for me to identify those contracts. I have seen con-

917 tracts describing the Company's practice. I have seen probably 100 or more forms of contracts between the Illinois Bell Telephone Company and its exchange subscribers in Chicago. I saw these contracts recently, but they were ones executed prior to 1907. It is from these contracts and other things that I have derived my information on this subject.

I could hardly be in the telephone business and know the Illinois Bell people as I have known them for almost twenty years, without gaining a very definite impression upon which to base a conclusion as to what they did. I have talked with them and consulted with them from time to time. I have

918 looked into their rate practices and examined their contracts. I have looked at their tariffs. I did not look at their tariffs prior to 1907, nor did I have any discussions with them with reference to their practices prior to 1907. In my experience in the telephone business, I have acquired a general knowledge of how the business grew up, and I have been able to reach conclusions which I think are reasonable; any man could have reached the same conclusions who has had the same experience I have had.

I have assumed that the practice in Chicago was similar to the practice which I knew prevailed throughout the telephone industry, although I formed a conclusion based on various

items of information which I have seen and which I have acquired from time to time in the course of my life.

919 I never heard of a court order requiring the Chicago Telephone Company to refund to local exchange subscribers a portion of the charges which it had made them for local plant in long distance service. I am not sure that I ever heard of the Chicago Telephone Company making any refunds at any time. A number of Bell companies, in connection with rate litigation, have had to impound money and subsequently refund it, but I am not sure about the Chicago Company. I never heard of the Chicago Telephone Company refunding money prior to 1907.

922 I think I have seen the ordinance of 1913, under which the Chicago Telephone Company operated, which has been identified as Defendants' Exhibit D-18.

I knew the Central Union Telephone Company and some of its officers. I visited this Company and consulted with its officers, and they visited me in New York and consulted with me, and I corresponded with them. I would not be able to give its corporate history, or the dates on which various incidents happened in connection with its corporate history. I do not believe that I am familiar with its license contract with the American Bell Telephone Company or the American Telephone and Telegraph Company. Most of my experience with the Central Union Telephone Company was while it was

923 in receivership. I knew the receivers. I do not know whether the Central Union Telephone Company had a license contract between it and the American Company on Form 109-D, nor do I know whether it had for extra-territorial business a contract Form 113-D. I am not sure whether it had Form 116-C for private lines. It undoubtedly had a contract with the American Telephone and Telegraph Company, but I do not know what contract, nor what form it had.

924 The Tariff and Route Book, which has been identified as Plaintiff's Exhibit A-66, from its nature would enable any person who had the rate schedules and rate charts before

him to determine the rates from any point served by the Illinois Bell Telephone Company and its connections in Illinois to any other points in Illinois, or outside of Illinois. It relates to the rates of the American Telephone and Telegraph Company, and covers points "reached via the lines of the American Telephone and Telegraph Company and its connections." If the 100-mile contract of the Central Union Telephone Company was in effect during the time of this tariff, it would relate to those rates. There is no reference in this tariff to any contract. I recognize what is meant by the 100-mile contract, but I have never seen it; I do not know whether it is in the possession of the American Telephone and Telegraph Company, but if it is a contract signed by the American Telephone and Telegraph Company, I assume they have kept
930 a copy of it. If the contract is in the files of the American Company, I will let counsel for the City see it.

931 In a general way, I am familiar with the rate schedules for exchange service filed by the Illinois Bell Telephone Company, covering exchange service in the City of Chicago, from 1893 to date. I have examined those rate schedules.

932 I should think that the sheets from the rate schedules of Illinois independent telephone companies, which are listed in the first portion of Plaintiff's Exhibit A-68, are part of exchange schedules and not of toll schedules. Some of these companies, with which I am familiar in a general way, have no toll lines.

933 There is no paragraph in the tariff of the Illinois Bell for its Chicago exchange defining local exchange rates in the same language as that contained in each of the schedule sheets which are reproduced in Exhibit A-68, as follows:

> "The local exchange rates herein shown are for local exchange service which includes service and connection with the toll boards having connected thereto the toll lines which connect with the * * * local exchange."

934 There is a statement in the schedule covering the exchange service in the City of Chicago, as follows:

> "Subscribers to Chicago Exchange System service

may, on the terms of their contracts, transmit local messages to all exchange telephones located within the limits of the City of Chicago.

"A local message is a communication not exceeding five minutes' duration between subscribers' stations
935 within the same exchange limits. By ordinance of the City of Chicago and these regulations the subscriber, lessee or patron is forbidden to charge any person more than five cents for a single message transmitted to any point within the City of Chicago from any telephone furnished under the contract of which these regulations are a part."

That statement in the regulations appearing in the Chicago exchange tariff is not in any sense a complete definition of exchange service.

There is nothing in the regulations in these schedules that says that the subscriber will get a telephone. It is im-
936 plied by saying that he must take care of the telephone.

I think you would have to read the entire tariff to determine what kind of service an exchange subscriber is entitled to. I think that all of the tariffs of the Illinois Bell Company should be taken as a whole for the City of Chicago and for the service which people can get from Chicago; by that I mean the toll tariff and exchange tariff together, and all other tariffs. I think that the generally accepted custom and usage of the business go to show what the Telephone Company meant when it was talking about exchange service.

There is no definition of exchange service, in so many words, in any one place in the exchange tariff, which completely defines exchange service, in my judgment. There
937 is nothing in the tariff that says that the subscriber is entitled to a directory listing, and yet that is one of the things he is entitled to. A provision similar to that shown in Exhibit A-68, providing that the exchange rates cover access to the toll board, is contained in the tariff of the Illinois Bell Telephone Company for toll service, and is implied in the
938 exchange schedules. It is not stated explicitly in the exchange schedules, but I draw the conclusion from them that the service includes facts in line with that definition.

939 There is included in the exchange tariff a statement of the rates for long distance terminals, that says:

"For long distance and toll use only; terminates in long distance switchboard; including mileage charge, measured by the most direct street distance, from the Exchang through which subscriber's line is operated to
940 Toll center, 111 N. Franklin Street, for first one-half mile or less, $4.50; for each additional quarter mile or fraction, $1.25."

There is an exchange rate which provides for the use of facilities that cannot be used except for communication with the toll board. The revenues from the application of that rate are exchange revenues. That toll terminal does nothing more or less than furnish access to the toll board; that is the only thing it can be used for.

That is one of the things that leads me to the conclusion that the local exchange rates include access to the toll board. The words "exchange service" and "exchange rates" have a definite meaning; they have grown up in the business to have a definite meaning, and there is no doubt on the part of such telephone men as I know (and I know a great many of them, both in the Bell and independent field) about what is meant. In my experience with our customers, there has never been any doubt on their part as to what was meant.

941 After reading the tariff of the Illinois Bell Telephone Company, I am satisfied that I know what is meant by exchange service, and that it includes the right of access to the toll and long distance boards upon payment of the exchange rates. There is no very specific language; there is no language as specific as that contained in the toll tariff of the Illinois Bell Telephone Company. Continuously throughout the tariff appears the word "exchange" and the words "exchange service" and "coin box service," and reference to measured rate service, and all of these services have that meaning to me. I do not know whether the sheets superseded by Sheet 1, Ill. C. C. No. 2, Section 1, shown on
942 page 1 of Exhibit A-68, referring to Versailles, Illinois, contain language identical to that contained in the first of the two quoted paragraphs.

When I was reading before from the Chicago exchange schedule, I was reading from the one now in effect. I was reading from a sheet of the Illinois Bell Telephone Company tariff for its Chicago exchange, headed "I. P. U. C. No. 1, First Revised Sheet No. 5, Canceling Original," issued December 27, 1920, effective January 1, 1921, filed by A. R. Bone. Mr. Bone at that time was General Commercial Superintendent of the Company.

950 I assume that if the companies in the State of Illinois have toll properties, they would file tariffs covering their use, and if they had none, they would only file exchange tariffs. I do not know whether all of them or some of them, or how many of them have toll lines, but I think it would be found that a great many of them have no toll property.

From the language in the sheets from the State of Indiana, appearing in the same exhibit (A-68), I am unable to go behind the certificate as to whether or not the tariff covered by the certificate is a toll tariff or an exchange tariff. I do

951 not know. The words "The local exchange rates herein shown" indicate that they are used in connection with an exchange tariff.

I have in mind, however, that I have seen independent companies make one filing for both exchange and toll service, but I do not know whether there is a separation between the two or not. I would assume from the language that it would

952 be a part of an exchange tariff. There is one toll tariff in here, and that is the tariff of The Tri-State Telephone and Telegraph Company, in the State of Minnesota, that specifically states it is a toll tariff, but it is the only one, I believe, that does state that. I do not know the definition of "local exchange service," contained in the local exchange tariff existing at the same time and in the same community covered by the tariff that is reproduced in Exhibit A-68 in the case of The Tri-State Telephone and Telegraph Company of Minnesota.

960 I am familiar with the definition of "station-to-station toll service" which was contained in the Illinois Bell Telephone Company's toll rate schedules for toll rate service prior to 1925. That definition, as filed in 1920, was: "a connection

between any two telephones (including private branch exchange switchboard operator), and does not contemplate the establishment of conversations between particular individuals."

961 The companies whose sheets are reproduced in Exhibit A-67 would have to define station-to-station toll service in some way or other if they filed a toll tariff since 1919, when that particular classification of toll service was established by order of the Postmaster General. I do not know whether their schedules contain a definition of station-to-station toll service similar to the one in the Chicago Telephone Company's schedule. They would undoubtedly have to define what they meant by station-to-station toll service, however, but I do not know how they defined it.

964 The license contract of September 25, 1930, does not cover all of the arrangements between the Illinois Bell Telephone Company and the A. T. & T. for the use of the Chicago facilities for long distance service in the City of Chicago.

965. I do not believe that any of the studies to determine the percentage of exchange subscribers who use the toll service of a given company (about which I testified on direct) related to the business of the Illinois Bell Telephone Company in the City of Chicago. I have made such studies in Denver and in cities in the northwest, of which I think Minneapolis is one, and perhaps Omaha another; I have secured information concerning cities in the south on that point a number of times. The dates of these studies would be in the period from, say, 1914 to 1925, or some place in there.

966 Subsequent to the tariff of the American Telephone and Telegraph Company filed in 1917, to which I have referred, there was a filing of that Company on November 1, 1919, and another issued on March 1, 1924. Shortly after that time, the American Company withdrew from intrastate business in Illinois, and ceased to make filings with the
967 Illinois Commission, I believe. These filings refer to all business of the American Telephone and Telegraph Company, both intrastate and interstate. Prior to 1925, the American Company carried on an intrastate business in Illinois as

well as an interstate service. They withdrew from that intrastate service some time around 1925, and at that time I assume that they withdrew their filings, or their filings ceased to have any significance as to intrastate business in Illinois.

968 *Re-direct Examination by Mr. Thompson.*

Some reference was made in my cross-examination to a toll schedule showing the station-to-station toll rate. That
969 sort of service was first established about 1919. Prior to that time, a number of companies gave what they called a two-number service, the distinction between that and the usual toll service being that, in the two-number service, the company did not undertake to secure the presence at a distant telephone of a specific individual. This service was also called "A-Y service", "A-Y" being our abbreviation of "Anyone". In 1919, when the Postmaster General established the so-called P-M-G schedules of toll rates, he referred to these particular classes of calls as station-to-station. The denotation of those words was that the telephone companies did not attempt to get to the distant telephone the presence of a specific individual. It was to distinguish between another class of rates, called person-to-person rates, where we undertook to secure the presence at a telephone of a particular person. There was a difference in the rates; one was cheaper than the other.

When the designation "station-to-station" was first
970 used, it was necessary for the companies having toll schedules not only to put into effect their rates for the station-to-station service, which were different from their person-to-person rates, but also to define the term "station-to-station" in their toll tariffs.

Re-cross Examination by Mr. Goldstein.

There was no service called "station-to-station service" prior to the time of the Postmaster General's order, which, I believe, was issued in January, 1919. I was in France at the time, and I do not remember the exact date, but it was about that time.

971 LAMBERT N. WHITNEY, called as a witness on behalf of the plaintiff, having been first duly sworn, testified as follows:

Direct Examination by Mr. Thompson.

My name is Lambert N. Whitney, and I live in Boston, Massachusetts. I am employed as Assistant Vice President by the New England Telephone and Telegraph Company, which operates in 5 New England States. I have been in the telephone business about 36 years.

After graduating from the Massachusetts Institute of Technology in 1896, I went immediately with the American Telephone and Telegraph Company in New York. During the next 7 years I held various positions in various depart-
972 ments there, the responsibilities of which were in connection with the construction, maintenance, operation and accounting of the long lines. In 1903, I went to Indianapolis as Division Superintendent of the Central Union Telephone Company, for the State of Indiana. My responsibilities there were in connection with the construction, maintenance and operation of the plant in Indiana, but at that time there was a very important department known as the Connecting Company Department and the head of that department reported to me. At that time, there were a large number of independent or competing telephone companies, and the function of this Connecting Company Department was to negotiate agreements between these independent companies and the Central Union Company covering the interchange of traffic, and then to develop the proper schedules under which we should operate.

In 1911, the Central group of telephone companies was formed. That group consisted of the Wisconsin Telephone Company, operating in the State of Wisconsin; the Michigan Telephone Company, operating in the State of Michigan; the Cleveland Telephone Company, operating in Cleveland, and

in Cuyahoga County; the Chicago Telephone Company, operating in Chicago and adjacent counties; and the Central
973 Union Company, operating in Indiana, Illinois and Ohio.

This Central Group was formed in 1911, and included the Chicago Telephone Company, operating in this City. This Central Group had a common executive management, located here in Chicago, and at that time I assumed the position of General Agent for Connecting Companies, reporting to the Vice President. The duties of that department were similar to the duties that I have described for that department in the State of Indiana, although the Connecting Company Department in the Central Group covered 5 States, and involved much more complicated and more important problems.

974 In 1912, the Central Group organization was changed, and at that time I returned to Indianapolis as General Manager for the State of Indiana, with responsibilities similar to those I had held as Division Superintendent. I stayed in Indiana until 1914, which was the time of my first connection with the New England Telephone and Telegraph Company.

When I first went with the New England Telephone and Telegraph Company in 1914, I assumed the position of General Commercial Manager. The duties in connection with that position involved responsibilities for the determination of what classes of service should be offered to the New England public; the responsibility for pricing that service, or developing a rate schedule; and a general responsibility for selling that service.

My telephone experience has involved the study of the making of toll and exchange rates. All the telephone rate
975 schedules with which I have been associated have involved both exchange and toll rates.

I have not personally had to do with the study and preparation of rate schedules during my entire experience in the telephone business. During the first 7 years of my employment with the American Telephone and Telegraph Company, there were no duties in connection with the rate schedules, but during the following 29 years, both in the middle west and with the New England Company, my responsibilities have been in connection with telephone rate schedules.

During my experience in this particular phase of the business, covering 29 years, there has been a distinction between toll rates and exchange rates. The distinction has been very definite that the exchange rates provide for service within
defined local areas, and toll rates provide for the service
976 between these defined local areas. In all of the rate schedules with which I have been associated, the exchange rates, through associated exchange service, have always afforded the subscriber the privilege of communication with all stations and all switchboards within the defined local area. The toll rates have always paid for toll service, which starts at the toll board; and the exchange rates have paid for the exchange service associated with any given toll message. The rate schedules which I have formulated have been fixed upon the basis which I have just stated.

When we terminated our toll lines in toll stations which were connected directly to the toll lines, the users of the toll service, in order to use the toll lines, came to the toll station,
and no exchange service was involved. When we con-
977 nected our toll lines with the exchanges of these independent companies, the users of the toll service talked from their premises, and the service between their premises and the toll lines was involved in connection with the toll message. When we closed our toll stations, and connected our toll lines into the local exchange, we made no change in our toll rates in order to provide for this service between the subscriber's station and the toll line. As a matter of fact, our toll rate between two toll stations a given distance apart has always been the same as our toll rate between the subscribers of two exchanges the same distance apart.

I am familiar with the class of service furnished by the Illinois Bell Telephone Company called "long distance terminal loop"; that is quite a common practice. If a subscriber's use of the service between his premises and the toll board is great enough to involve the entire use of a pair of wires, such pair of wires is furnished, and the service over
those wires between the subscriber's station and the toll
978 board is paid for by a special rate, which is in addition

to the toll rate. This additional rate is an exchange rate, and is included in the exchange revenues.

I know the basis upon which contracts with the so-called connecting companies were made while I was in charge of the work of making such contracts and preparing rate schedules in connection with the independent and so-called connecting companies. When I arranged for connections with the local or independent companies in a manner that involved only the local property of the local company, no through rates were established. If, however, the connection that we arranged for with such local company involved their toll property, then a through rate was established covering our toll service and the associated toll service of the local company in connection with any given toll message.

979 When we connected our toll lines directly into the exchange of an independent company, our toll rates did not cover any part of the exchange service rendered by the connecting company in completing these calls, and no through rates were established under such conditions. The toll rates covered the toll service between the toll boards, and the exchange rates covered the exchange service in connection with any given toll message. In that case, there was no division of the established toll rates as between our Company and the connecting companies. We retained it all. Of course, we paid these connecting companies for services rendered in connection with selling, billing and collecting for our toll revenues, but these services were of the same type and for the same purpose as had been involved when we had been previously dealing with our toll agents when no through rates were involved.

When through rates were involved, the division of revenue involved in that through rate was generally provided for on the basis of the relative length of the two companies' toll
980 circuits involved. There was nothing included in these through toll rates for service between the subscriber's station and the toll board rendered in connection with the furnishing of the toll message. The situation there was the same as where we connected our lines directly to the exchange of the local company, without including any toll property.

The exchange service between the subscriber's station and the toll board under these conditions was exactly the same as where there were no through rates, and that service was not involved either in the development or the division of the through toll rate.

Cross-Examination by Mr. Haight.

There is quite a lot of the special wire service of which I spoke; it is largely with the large business firms. Generally,
it is entered into by customers when toll service is very
981 extensive, and it is desirable to have a special wire from
their premises to the toll board. The largest users of toll service in any large community tend to become more and more users of the special wire service; that is the natural economic development.

In the testimony I have just given upon my direct examination, I have not undertaken to give any interpretation of any special contracts existing here in Illinois with reference to the business of the Chicago Telephone Company, or of the Illinois Bell Telephone Company in its Chicago area. I have tried to state the practices which I have followed, and have left out of consideration entirely any statutes, ordinances or contracts.

During the days of the Central Group, I had nothing to do with the development of the exchange rates, or of the toll
rates, of the City of Chicago, except to this extent: at
982 that time there was a competing telephone company in
Chicago, and negotiations were under way for the merger of that exchange. In connection with that, there was no consideration given by me to any changes in the toll rates due to the addition of the local service of that company between its stations and the toll board.

Re-direct Examination by Mr. Thompson.

When I referred to a time when the Bell Company with which I was affiliated connected up with independent telephone companies, I meant local telephone companies with which it had connecting contracts.

ALLAN B. CRUNDEN, called as a witness on behalf of the plaintiff, having been first duly sworn, testified as follows:

Direct Examination by Mr. Thompson.

My name is Allan B. Crunden and I live in Montclair,
983 New Jersey. I testified on the former hearing of this cause, at which time I was the Assistant Comptroller of the American Telephone and Telegraph Company, which position I still hold. I have had about 30 years' experience as an accountant and statistician, including the years spent in telephone accounting and statistical work in the Bell System, which amount to about 20 years.

I am familiar with the accounting methods for obtaining a correct separation of telephone property, revenues and expenses between exchange and toll, and as between interstate and intrastate operations. I was called upon in 1922 to make such a separation and to testify regarding it before the
984 Public Service Commission of Tennessee. I also made a separation of the business of the Southern Bell Telephone and Telegraph Company in the State of Mississippi for incorporation in an affidavit to be filed in a then pending confiscation case in the Federal Court. As a result of my connection with those two early cases of separation, I have been consulted regarding, and have rendered, assistance to the associated companies of the Bell System in all cases of separation since that time, including the New England Telephone and Telegraph Company, the Ohio Bell, the Illinois Bell, and a number of others.

I advised with and assisted Mr. Kruse and Mr. Mapes in the development of the methods of separation which they used and applied to the property, revenues and expenses of the Chicago area of the Illinois Bell Telephone Company in this case. I have examined the exhibits which have been introduced in evidence here, showing, respectively, the methods used in making the separation and apportionment of the plaintiff's property, and of its revenues and expenses.
985 In my opinion, the methods shown by these exhibits are sound methods for obtaining a complete separation all

the way through the plant, beginning with the subscriber's station, on a use basis, and, properly applied, they will produce a result that is correct for all purposes of sound accounting.

From 1910 to 1919, I was in charge of the general accounts and statistics of the Chicago Telephone Company. The nature of my duties in that position required me to become familiar, and I did become familiar, with the Company's rates for exchange service and for toll service, and the kinds of facilities that were made available under each of these types of service.

987 Exchange service is the aggregate of the facilities provided within a designated local service area for the purpose of enabling any subscriber to the service in that area to obtain communication with any other local subscriber in the area, with the Company's offices, and with the terminal plant of the toll system, if any, in that area.

Toll service is the service rendered between exchange areas by means of toll lines, toll switchboards or portions of toll switchboards, and frequently also those short connecting lines known as toll trunks, which run from the toll switchboard to the exchange switchboard in which those trunks terminate and the exchange facilities begin.

Cross-Examination by Mr. Haight.

In saying that I was familiar with the methods of sep-
988 aration, and that I approved the methods that are shown by the exhibits and the testimony in this case, I was speaking only as an accountant.

When I undertook to give the definitions of "exchange service" and "toll service", I was speaking as a practical telephone man, and, primarily, of course, as an accountant, because that is my profession.

There was an exchange service in Chicago in 1891. I am not sure whether there was an exchange service in Chicago before there was any long distance service. If I were to assume that there was a plurality of telephones in Chicago,
989 with a central board, I would say there was an exchange service in Chicago before there were any long distance

connections whatever, and until long distance came, I would say there was then no toll service within the area. Under the assumption that there was exchange service in Chicago prior to the time that there was long distance service, my definition of "exchange service" would be the same in principle, but, in practice, of course, it would be different, because there were no toll facilities available.

As a practical matter, when the toll service came and was employed by a telephone user to talk in a telephone, and, through mechanism, be heard and receive replies from another at some distant telephone, that was not toll service; that was the toll conversation of the party.

"Q. What was the service in that case? What is the service? When I pick up the telephone in this room, for instance, and talk to New York City, what is the service? Isn't it talking from here to the telephone in New York City?

"A. That is telephone service.

"Q. That is the service?

"A. That is the service, telephone service.

990 "Q. And when I talk to another in Chicago, the service is talking to somebody in Chicago?

"A. That is telephone service.

"Q. Even though I talk into the same instrument, and partly use the same instrumentality?

"A. That is telephone service."

In giving my definitions, I had in mind the statutes of the State of Illinois and the contracts between the Illinois Bell Telephone Company, or its predecessor, the Chicago Telephone Company, and the American Telephone and Telegraph or other companies. I had all of them in mind. I considered that a rate schedule filed with the Illinois Commerce Commission was to be given force in determining the service that it was to cover. I had in mind that all of the schedules justified the definition which I gave of "exchange service."

991 One of the schedules which I had in mind was, for example, the Chicago exchange schedule effective between 1914 and 1919. I had these schedules in mind in this way: if I had the slightest reason to believe that there was anything

in those schedules or filings which negatived or tended to cast doubt on my understanding, as a practical telephone man, as to what this service was, I would not have given the definition.

992 "Q. All right. I will call your attention to the local exchange schedule that you specified, and I will read to you the following:

"'A local message is a communication not exceeding five minutes' duration between subscribers' stations within the same exchange limits.'

"Now, will you, in addition to that, find anything in the schedule that you say justifies your definition? If so, pick it out and read it on the record specifically.

"A. Right above where you were reading, Mr. Haight, it says 'Exchange Service'".

Now, to my mind, that means that the subscriber is entitled to certain services, which are well understood and comprehended in the term, just as much as if I were to go to a store and I would see a sign: "Apples, 5 cents". I know what an apple is. There is nothing in that paragraph hereinabove quoted and read to me by counsel for the defendants upon which I base my definition of "exchange service". I did

993 not say that. The entire paragraph reads as follows:

"A local message is a communication not exceeding five minutes' duration between subscribers' stations within the same exchange limits. By ordinance of the City of Chicago and these regulations the subscriber, lessee or patron is forbidden to charge any person more than five cents for a single message transmitted to any point within the City of Chicago from any telephone furnished under the contract of which these regulations are a part."

Immediately before the paragraph which I just read, appears the following:

"Subscribers to Chicago Exchange System service may, on the terms of their contracts, transmit local messages to all exchange telephones located within the limits of the City of Chicago."

994 Another thing appearing in the schedule upon which I base the definition which I gave on direct, are the words "exchange service", and the collateral evidence furnished by the fact that the long distance terminals are included in this exchange tariff.

I was asked whether I took into account these schedules, and I said that I did. To say that I arrived at my opinion on the schedules is not quite the same thing. I am trying to point out that these words "exchange service" in these schedules have a definite meaning, and I say there is nothing in this tariff inconsistent with the understanding that I arrived at.

995 In arriving at the definition that I gave on direct examination, I used the schedule as an entity. As I say, my knowledge is that of a practical telephone man. I went into the business and had to find out, like other people do, what is meant by exchange service. Now, this schedule is a thing that enters into the consideration of it. I was asked to define exchange service, and I did so. I was asked whether this had any bearing on the matter, and I said it had. If there were anything in that schedule that in any way negatived or cast doubt upon what I said, I would never have made the statement.

In arriving at the opinion that I gave, I took into consideration that material from the schedule which has been read into the record, and I took into consideration that the schedule used the words "exchange service". I did not
996 take anything more into consideration than the fact that this is an exchange service schedule.

I understand that the Company is required to file its schedules with the State authorities, and I had in mind, in arriving at my opinion, that these schedules were filed with the
997 State authorities. I never read the section of the statute, that counsel for defendants has just read, which provides that all rules and regulations, privileges and contracts, that in any manner affect the rates charged or to be charged for any service, must be part of the schedule. Before I arrived at the opinion which I gave on direct examination in respect

to the definitions, I considered that the statute was in existence.

I also took into consideration Section 35 of the statute, providing that a public utility is required not to perform any service or to furnish any product or commodity unless or until the rates and other charges and classifications, rules and regulations relating thereto, applicable to such service, product or commodity, had been filed and published in accordance with the provisions of the act.

998 I did not discuss with anyone all of these statutes, ordinances and rate schedules, and all of the other matters of that character that I took into consideration, before I came on the stand, but I did discuss some of them. I discussed with Mr. Cleveland and Mr. Bickelhaupt our mutual understanding as to what exchange service was.

So far as I can remember, I did not discuss with anybody the effect of the ordinances of the City of Chicago, nor the various provisions of the statute of the State of Illinois. I discussed with Mr. Cleveland and Mr. Bickelhaupt the filed rate schedules within the last month, and I also discussed

999 these schedules with Mr. Noble of the Commercial Department of the Illinois Bell. I repeatedly discussed that part of the license contract which has to do with the compensation of the local company for the service which it provides in connection with the toll service. I mean by the license contract, the so-called 4½ per cent contract, which is now the 1½ per cent contract. I do not mean the 1881 contract, but I mean the 1919 contract. I have repeatedly dis-

1000 cussed that with many people. I have discussed that contract with dozens of people at various places, among them being Mr. Wlodeck, Mr. Behan, Mr. Saxton, Mr. Shaver, Mr. Heiss, Mr. Brooks and Mr. McTiernan.

I did not, in any of these discussions, mention the contract of 1881. I did not consider the section of that contract reading as follows:

> "In case the Licensor, its successors, or grantees shall desire to connect points within said territory, with points outside said territory they shall have the right

to connect with or avail themselves of the lines and facilities of the party of the second part or its licensees, owners of exchanges or public lines making a reasonable and suitable division of the tolls and profits of such
1001 extra territorial and through business, and if/or so far as said Licensee or its sublicensees shall not have or shall not furnish suitable lines and facilities then said American Bell Telephone Company may within said territory construct such lines and use such telephones as may be necessary for such purposes."

I never read that contract.

I have heard of Form 109-D, but I never investigated for the purpose of finding out. I have heard Form 113-D spoken of, but I have no familiarity with those early contracts.
1002 When I first came into the business, in 1910, I was General Bookkeeper of the Chicago Telephone Company. I was required to make statistics and accounts for administrative purposes covering exchange and toll operations. In order to do that, it was necessary for me to find out what exchange service was and what toll service was. I investigated that by inquiry and conferences with older and more experienced practical men, and arrived at a conclusion on that point. I prepared the statistics for the officers based on my understanding. That was in 1912, 1913, and so
1003 on. I was Auditor of the Wisconsin Telephone Company, which was required by law to make a separate annual report for each exchange system, and a report for its toll system. It was not possible for me to make those reports without a definite understanding as to what exchange service was and as to what toll service was, therefore, I proceeded to inform myself.

This term "station-to-station basis", used in connection with the separation, is a loose term. It can be used to describe two different kinds of station-to-station bases.

The first station-to-station separation that I had anything to do with was in the New York case. The station-to-station separation in that case had to do with local tolls.
1004 This is the first case in which I have had to do with a separation involving interstate business made upon a

station-to-station basis. Generally speaking, the previous separations I have made have been upon what is called the board-to-board basis, except in the New York case.

The present separation results in the separation of exchange and toll business on a board-to-board basis, and also in the separation of interstate traffic on a station-to-station basis. The board-to-board basis is not any theory. I
1005 do not want it to be understood that I have gone off the board-to-board method. We are still on the board-to-board method. The new thing in this case is the separation of the exchange service facilities between interstate traffic and other traffic. That is the new thing injected into this case.

The reason for the exception in the New York case was as follows: the City of New York had grown to be such an immense area that it no longer represented merely the island of Manhattan, but a whole group of fairly sizable cities. It was just as if you might take Chicago as the nucleus and add to it Evanston, Glencoe, Elgin, Joliet, Aurora, and other points between which and Chicago, and between which and each other, there are at present short-haul toll rates. If you were to take all of those areas into the City of Chicago, you would cease to have clear-cut toll rates, and they would prob-
ably become exchange rates. The reason that the
1006 exception was made in New York was in view of the then present status of such short-haul toll rates. They existed on a station-to-station basis. I did not go back far enough into past history to find out whether they were built up years before on such a basis or not. The charge for local toll service in New York was on a station-to-station basis at the time of the separation, and, as regards this particular business, the local rate did not include the right to connect with the toll board.

The two kinds of station-to-station separation that I had in mind are these: throughout the United States, so far as
my knowledge goes, outside of the restricted condition
1007 in and around New York City, the exchange service includes the privilege of connection with the toll. A

separation that proceeds in accordance with that is a station-to-station separation, in which it is necessary to take out certain of the exchange service facilities and assign them to interstate. That is one kind of separation. The other separation is one that affects this exception; that is, such a condition as exists in New York, where there are certain short-haul tolls that are in the nature of exchange service. By short-haul tolls, I mean local tolls of the New York Telephone Company. There the toll rates must be treated as though they went back to the station, so that you get a slightly different proposition from a classification standpoint.

After having taken into consideration the statute and the ordinances and the rates filed, and all of the other things about which I have testified, I have not been able to find that Chicago is any exception to the general practice of the Bell System.

[illegible]

District Court of the United States

FOR THE NORTHERN DISTRICT OF ILLINOIS

EASTERN DIVISION

ILLINOIS BELL TELEPHONE COMPANY,
Plaintiff,

vs.

G. SALE GILBERT, F. PAUL KUHN, WALTER E. WILSON, WILLIAM H. BRINKMAN, PHIL W. COLLINS and PAUL SAMUELS, the persons constituting the Illinois Commerce Commission of the State of Illinois, and OSCAR E. CARLSTROM, Attorney General of the State of Illinois,
Defendants,

and

CITY OF CHICAGO, a municipal corporation,
Intervenor.

[illegible]

ABSTRACT OF RECORD

PLAINTIFF'S EVIDENCE

VOLUME II—(Pages [illegible] to [illegible])

WILLIAM H. [illegible],
Corporation Counsel, City of Chicago,

GEORGE L. [illegible], and
BENJAMIN F. [illegible], and
EDMUND [illegible],
On behalf of City of Chicago,
Intervenor.

OSCAR E. CARLSTROM,
Attorney General of Illinois,

and

WILLIAM H. [illegible],
Assistant Attorney General,
On behalf of Illinois Commerce Commission.

CHARLES M. [illegible],
WILLIAM H. [illegible],
[illegible],
EDWARD [illegible],
On behalf of Plaintiff.

HORACE KENT TENNEY,
LESLIE [illegible],
Of Counsel.

IN THE

District Court of the United States

FOR THE NORTHERN DISTRICT OF ILLINOIS,

EASTERN DIVISION.

ILLINOIS BELL TELEPHONE COMPANY,
Plaintiff,

vs.

G. GALE GILBERT, J. PAUL KUHN, WALTER H. WILSON, WILLIAM M. BRINKMAN, PHIL W. COLLINS and PAUL SAMUELL, the persons constituting the Illinois Commerce Commission of the State of Illinois, and **OSCAR E. CARLSTROM,** Attorney General of the State of Illinois,
Defendants,

and

CITY OF CHICAGO, a municipal corporation,
Intervenor.

In Equity
No. 3746.

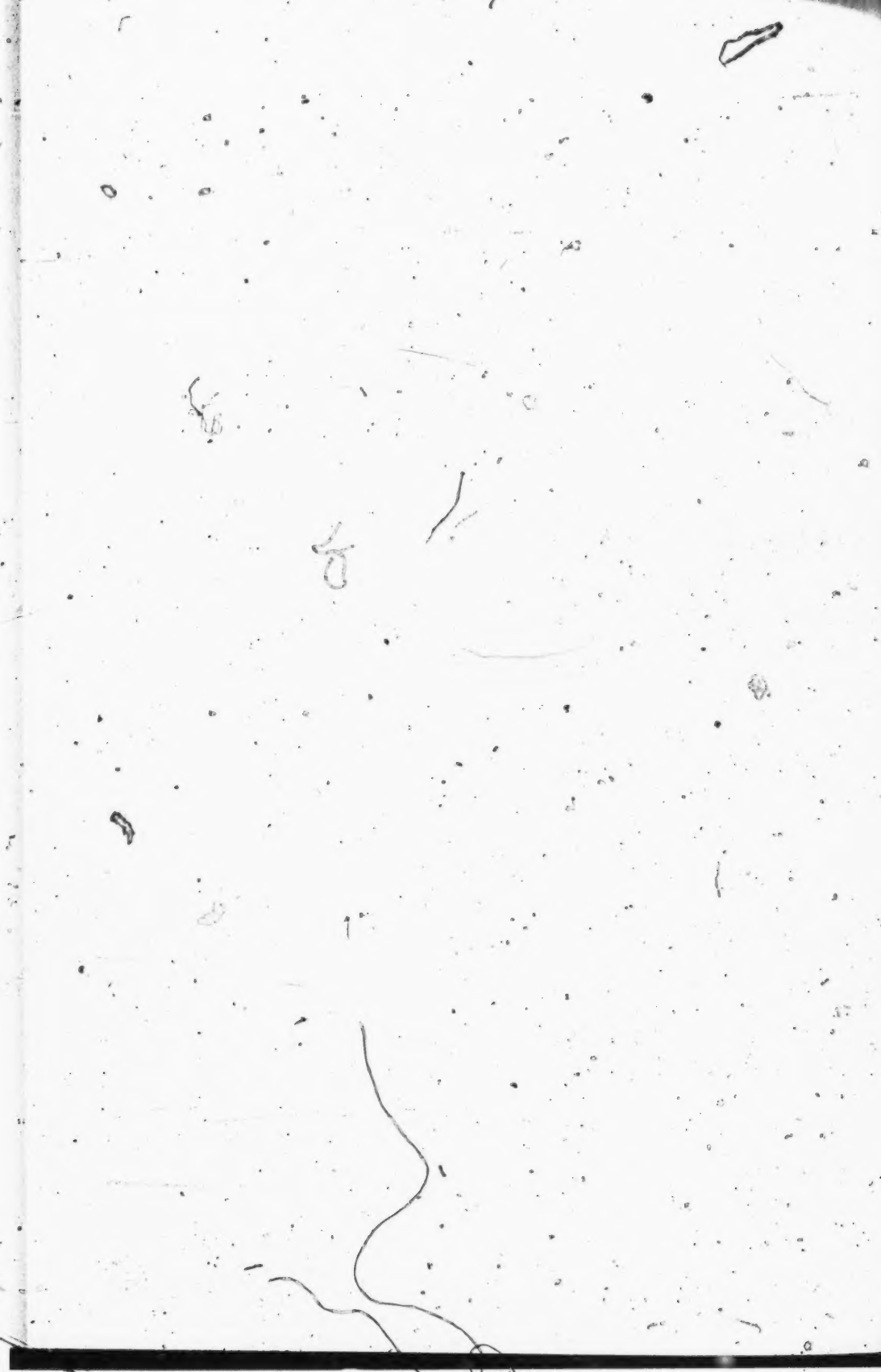
—

Heard before
Hon. Evan A. Evans
Hon. George T. Page
Circuit Judges
and
Hon. James H. Wilkerson
District Judge.

ABSTRACT OF RECORD

Plaintiff's Evidence

Volume II—(Pages 309 to 605)



1009 RICHARD H. GREGORY, called as a witness on behalf of the plaintiff, having been first duly sworn, testified as follows:

Direct Examination by Mr. Thompson.

1010 My name is Richard H. Gregory. I live in Montclair, New Jersey. I am Comptroller of the Western Electric Company, and have been for 23 years.

Shortly after graduation from college, I entered the employ of the Western Electric Company (on August 1, 1898) in a clerical capacity. In December of that year, I became Assistant Chief Clerk of the New York house. In 1900, I was transferred to Chicago, to the Secretary's Department, and in 1902 I was transferred back to New York as the representative of the Secretary. In 1905, I was made Assistant Secretary of the Company, and transferred to Chicago, where the headquarters of the Company were at that time. I remained in Chicago until October, 1908, when I was transferred to New York and appointed Comptroller of the Company, which position I have held since.

1011 As Comptroller, I am the Chief Accounting Officer of the Company, and have charge of the preparation of the balance sheets and profit and loss statements. All of the accounting records are under my supervision and control.

The manufacturing plants now owned and operated by the Western Electric Company are: the Hawthorne plant located at Chicago, Illinois; the Kearny plant located near Kearny, New Jersey; the Point Breeze plant at Baltimore, Maryland; and the Queensboro plant located on Long Island. Only the Hawthorne plant has been operating continuously since 1916. The Kearny plant was constructed prior to 1925, and commenced operations in 1925. The Point Breeze plant was constructed and began operations in 1929. The Queensboro plant was acquired in 1929.

1012 The dollar sales of goods manufactured by the Western Electric for the period 1916 to 1931 amounted to nearly $2,400,000,000. The lowest year was in 1916, when the sales amounted to $46,500,000, and the highest, in 1929,

was $278,000,000. During that same period of time, 1916 to 1931, raw materials and supplies amounting to $700,000,000 were purchased from others and used by the Western Electric Company in its manufacturing business; the lowest year was in 1919, and amounted to $17,000,000; the highest was in 1929, and amounted to $103,000,000. During the same period of time, the lowest annual payroll of the Western Electric Company for its productive labor was in 1916, and amounted to $10,000,000; the highest was in 1929, and amounted to $78,000,000.

The Western Electric Company operates distributing houses from which its manufactured goods and supplies are distributed to its customers; there are, at the present time, 32 such distributing houses located in the principal cities throughout the United States. There has been a gradual growth in the business done by these distributing houses from 1916 up to the present time. These distributing houses carry stocks of Western Electric manufactures, and of supplies purchased from others for resale to the Bell associated companies. They also receive goods returned by the Bell associated companies for reconditioning or re-use. All goods sold to the Bell associated companies, whether they are delivered directly from the factories, or through the distributing houses, are invoiced through the distributing houses.

The Western Electric Company also has an organization for the installation of central office telephone equipment. The headquarters of the Installation Department are in New York, and it has 13 branches throughout the principal cities of the United States.

During the period 1916 to 1931, the lowest number of employees of the Western Electric Company was 17,000 in 1916; and the highest number was 85,300 in January 1930. At the end of 1931, there were 44,600.

The executive offices of the Western Electric Company, including its Accounting Department, are located at 195 Broadway, New York City.

In 1916 there were approximately 1,000 employees in the Accounting Department, of which I am the head. This number gradually increased until the middle of 1930, to

5,000. At the present time there are approximately 3,300. These accounting employees are located at the Company's headquarters, at 195 Broadway, and at each of the manufacturing plants of the Company, and at the installation divisions and distributing houses to which I have referred. As of July 1, 1930, such accounting employees were divided among its several activities as follows: at manufacturing locations there were approximately 3,500; at distributing houses, 550; at installation divisions, 350; and at the general staff at New York, 430. The annual payroll of the Accounting Department as of July 1, 1930, was $8,500,000.

The chart which has been identified as Plaintiff's Exhibit A-70 shows the accounting organization of the Western Electric Company as of December 31, 1931.

During the years 1916 to 1931, the Western Electric Company has kept more than one set of ledgers, journals and cash books.

1016 The Company cash books, ledgers and journals have been kept at the executive headquarters at 195 Broadway, New York. The subsidiary ledgers, journals and cash books have been kept at the various manufacturing departments, installation divisions, and distributing houses to which I have referred.

Those general company ledgers, which are kept at the executive offices of the Company, and the subsidiary records, which are kept at the various other points, are kept in accordance with accounting routines and instructions issued from time to time by the Comptroller's office. These routines prescribe the principles of accounting for action by all departments of the Company, and for insuring accuracy and uniformity in the results which we receive from those various departments.

1017 I have in the court room the general accounting instructions of the Western Electric Company which are now in force. They consist of three books, aggregating over 1,300 pages. They include over 125 accounting subjects and cover all phases of the accounting of the Company.

During all of the period from 1916 to 1931, there has been maintained in the general accounting organization at New

York an auditing division, whose duties have been to audit the subsidiary records of all of the distributing houses, manufacturing department locations, and installation divisions. That has been done continuously since 1916, and even prior to that time. Also, since 1922, certified public accountants have audited our books, certifying to the accuracy of the balance sheets and income statements. During the years 1922 to 1925, inclusive, our books were audited by Price, Waterhouse & Company; for the year 1926, by Lybrandt, Ross Brothers & Montgomery; and from 1927 to the present time, by Arthur Young & Company. These audits are made for the purpose of insuring certification to our stockholders of the accuracy of our balance sheets and profit statements, and also for the purpose of ascertaining whether the accounting practices and routines prescribed by the Company have been followed in the accounting of the Company. We also have prescribed routines and instructions for making audits by our own employees.

The accounting books maintained by the Company at
1019 its executive offices at 195 Broadway, that I have described as the general accounting books of the Company, consist of journals, ledgers and cash books. There are 5 ledgers, 16 journals and 29 cash books, covering the period 1916 to 1931. All of them are now in the court room.

Entries in the Company ledgers are made at the present time by the Company bookkeeper, and in the journals and cash books, by several different people. The people who make these entries change from time to time. None of the employees of the Western Electric Company who have worked on the general books are now residents of or within the State of Illinois. No one person has knowledge of all of the facts with respect to the entries in the cash books, journals and ledgers.

1020 The entries which appear in the general Company books are made in accordance with our general accounting routines and subject to audit, as I have previously testified. These entries are made regularly and currently in the ordinary course of business by employees of the Company

entrusted with that work. In my opinion, such entries are accurately and correctly made.

It would not be possible to produce in Court all of the persons who have personal knowledge of all of the facts with respect to all of the entries made in the general ledgers, journals and cash books of the Western Electric Company during the years 1916 to 1931. Some of these persons are dead; some have left the employ of the Company; and thousands of them are scattered throughout the various localities of the country where we have distributing houses, installation divisions, and manufacturing department locations.

The subsidiary records which I have said are kept by the Western Electric Company at its various manufacturing
plants, installation divisions and distributing houses,
1021 consist of ledgers, journals and cash books. The instrument identified as Plaintiff's Exhibit A-71 shows the volume of these records, to which I have referred as the subsidiary records of the Company. This Exhibit A-71 correctly sets forth the ledgers, journals and cash books of the Western Electric Company, which I have termed subsidiary records, the places at which they are maintained, the number of such records, and the number of pages of such records. In total there are 1,258 of these records, consisting of more than 525,000 pages.

In the business of the Wesfern Electric Company at its various manufacturing plants, distributing houses, and installation divisions, during the period of time inquired about, the Accounting Department handled vouchers, cost records,
invoices, and the like. In recent years, the raw material
1022 tickets handled at our Hawthorne and Kearny plants alone have totaled over 3,000,000 annually. The number of items billed by our distributing houses in recent years has amounted to more than 10,000,000 annually. The labor tickets at our Hawthorne and Kearny plants, distributing houses, and installation divisions have amounted to more than 10,000,000 annually in recent years. The payroll checks issued have averaged over 3,000,000 in each of the last 3 years; that is, 1929, 1930 and 1931. Invoices from suppliers have amounted to more than 1,000,000 annually. All of these matters to which I have referred enter into and form a part of the accounting involved in the Western Electric Company.

The instrument identified as Plaintiff's Exhibit A-72 shows

the general instructions issued by the Western Electric Company providing for the preservation of certain records,
1023 memoranda, checks, invoices and other papers. This Exhibit A-72 is dated January 23, 1931, and replaced an issue of September 6, 1928. Generally speaking, the subject matter of the instructions which were replaced by this issue was practically the same as the subject matter of these instructions. The records which are referred to in Exhibit A-72 are preserved only for a definite period of years, and some of them are destroyed after the expiration of that period of years. None of them, however, are destroyed prior to the dates that are stated in these general instructions.

Under the accounting system of the Western Electric Company, reports are made to me from time to time as Comptroller by the accounting officers in charge of the records and accounting at the various manufacturing plants, distributing houses, and installation divisions of the Company. I, as Comptroller of the Company, also make reports from time to time to the executive officers of the Company and to the stockholders, based on the general accounting records of the Company and the reports made to me from the manu-
1024 facturing plants, distributing houses and installation divisions. Some of these reports which are made to me, and by me, are issued monthly, some quarterly, some semi-annually, and some annually. In addition to the balance sheets and profit and loss statements, these reports cover such items as sales, gross profits, expenses, net profits, merchandise, plant, receivables, cash, payables, personnel, and other items. These reports are a part of the records of the Western Electric Company, and are made currently in the regular course of its business by employees of the Accounting Department of that Company for the use of its officers and executives. These reports are audited by the Auditing Department of the Company. They contain, among other things, in summary form, the information which appears upon the
1025 subsidiary cash books, journals and ledgers kept and maintained at the various manufacturing plants, installation divisions, and distributing houses of the Company.

The general Company ledgers are made up from the general Company cash books and journals. A part of the information and data appearing on the general Company journals is made up from the reports to which I have referred. I have in Court at this time, not only the general Company ledgers, journals

and cash books for the entire period 1916 to 1931, but also all of the annual reports for the same period of time. Some of these reports were used by me in the preparation of the four exhibits identified as Plaintiff's Exhibits A-77, A-78, A-79 and A-80. These reports are bound together in volumes.

1026 I also have in Court, my work sheets and other information used by me in the preparation of these Exhibits A-77, A-78, A-79 and A-80 which show the total sales, cost of sales, profit on sales, return on investment, and total investment in Bell and non-Bell business of the Western Electric Company. These work sheets and other information are bound up in 107 volumes.

The general Company cash books, journals and ledgers, and the reports which I have described and which are all in Court, are the first permanent records of the transactions of the Western Electric Company which they purport to reflect. While the Company's subsidiary cash books, journals and ledgers are kept for at least 15 years, no closing entry is made in such subsidiary ledgers until first that entry is made on the Company books reflecting these transactions. The Company books have at all times during this period been considered as the controlling books of the Company.

1027 The Western Electric Company has relied during the entire period referred to (1916 to 1931), and does now rely, in making its calculations, its investments, and for the practical administration of its business (including the determination of its profit and return on its investment; on sales, and the like), on its Company books, located in New York, consisting of ledgers, journals, and cash books, and on reports received from subsidiary locations—subsidiary cash books, ledgers and journals.

There are no entries made upon the subsidiary books maintained at these various manufacturing plants, distributing houses, and installation divisions, other than the entries made with respect to the business transacted at or through those specific locations. There are no records maintained or kept by the Western Electric, other than the general Company journals, ledgers and cash books, and the reports made to me and by me, as Comptroller, from which it is possible to obtain information or data concerning the transactions of the Company in its entirety.

1028 Other than the records of the Hawthorne manufacturing plant, the Chicago distributing house, and the Chicago installation division, none of the subsidiary records of the Western Electric Company maintained at its various manufacturing plants, distributing houses, and installation divisions throughout the United States are within the State of Illinois. They are located at such far distant points as Boston, Atlanta, Dallas, Los Angeles, San Francisco and Seattle. The expense of transporting these records to Chicago under proper supervision would be substantial. The inconvenience resulting from these records being taken away from the various locations where they are needed, particularly for the later years, for the recording of current transactions, would seriously interfere with the current recording of our business day by day. The hazard of transporting over 1,200 volumes, consisting of 525,000 pages, of which we have no copies, would be extremely great. It would be
1029 difficult, if not impossible, to replace these records if they should be lost.

It is possible, in my opinion, for a competent accountant, by the sole use of the records which I have now in this court room, to determine the accuracy of all of the figures appearing on the 4 exhibits to which I have already referred, and which will be offered in evidence in connection with my testimony, showing sales, cost of sales, net profit on investment, investment, etc., in the Bell and non-Bell business of the Western Electric Company for the period 1916 to 1931.

I have prepared and submitted for inspection to the attorneys or representatives of the defendants in this case, certain data and information obtained from the general books and records of the Western Electric Company and its subsidiaries. This information was furnished them beginning with July 9, 1931, and continuing from that time up to and including March 9, 1932. I have prepared in exhibit form a list showing in detail the data and information so furnished or submitted for the inspection of the representatives of
1030 the defendants. This is the instrument identified as Plaintiff's Exhibit A-73. This exhibit refers not only to the data which have been actually submitted to them in statement form, but also to records which were submitted for their inspection.

All of the statements referred to in these exhibits could be

prepared from the books and records of the Company which I now have in the court room, without reference to the subsidiary records which I have described, with the exception of the exhibit to be introduced showing the division of sales of the Western Electric Company between the Chicago and the State areas; that information would have to be obtained from records which are located at Chicago, Illinois, and which can be produced in Court. The auditors, accountants and
1031 attorneys employed by the defendants have inspected the books and records of the Western Electric Company in its New York offices.

In the preparation of the exhibit which will be hereafter offered in evidence and identified as Plaintiff's Exhibit A-84 (which is a consolidated earnings statement of the Western Electric Company and its subsidiaries for the period 1916 to 1931), I used, in addition to the records of the Western Electric Company, the reports which I received from its subsidiary companies. They consisted of reports from the International Western Electric Company, the Northern Electric Company (which we do not control), and from other subsidiary companies. There are in Court now, the ledgers, journals and cash books of subsidiaries of the Western Electric covering the period 1916 to 1931, from which the information appearing on this consolidated earnings statement can be obtained, so far as such subsidiaries are concerned.

1032 The statement identified as Plaintiff's Exhibit A-74 gives a list of the particular records of the Western Electric Company and certain of its subsidiaries, which are now in Court.

The books and records of the Northern Electric Company, including its ledgers, journals and cash books, are kept at the headquarters of that Company in Montreal, Canada. The Northern Electric Company is not controlled by the Western Electric Company, and our statistics concerning that Company are covered by reports which we have received currently from them from time to time.

The Graybar Electric Company was sold to the employees

of that Company at the close of 1928, and its books passed out of the possession of the Western Electric. The results of the Graybar Electric Company after it passed out of
1033 the control of the Western Electric at the end of 1928, are not, of course, consolidated subsequent to that date. During the period from 1926 to 1928, inclusive, while it was a 100 per cent owned subsidiary of the Western Electric Company, it was consolidated, and we have complete reports for that period.

We have received reports from the Northern Electric Company currently, and its results have been included in this consolidated statement in the ratio of our ownership of that Company, which is 43.6 per cent.

In addition to the ledgers, journals and cash books of the subsidiaries of the Western Electric Company which are now in Court, I have assembled and there are now in Court in binders, all other records, reports and work sheets used in compiling the consolidated earnings statement of the Western Electric Company and its subsidiaries for the years 1916 to 1931. It would be possible for a competent accountant to determine from the records now in Court the accuracy of the figures appearing on such consolidated earnings statement of the Western Electric Company.

1034 The Western Electric Company of Illinois was organized in 1881. The present Western Electric Company (the Western Electric Company of New York) was organized in November, 1915, and commenced business November 17, 1915. The Western Electric Company of New York purchased the assets of the Western Electric Company of Illinois, and continued to carry on the business formerly conducted by the Illinois Company. Continuously since the organization of the Western Electric Company of New York, the American Telephone and Telegraph Company has owned a controlling interest in it. From 1916 to 1920, the American Telephone and Telegraph Company owned in excess of 97 per cent of the total outstanding common capital stock of the Western Electric Company of New York. Since 1920, it has owned over 98 per cent of the outstanding common capital stock.

I know of the execution of two contracts between the
1035 American Bell Telephone Company and the Western Electric Company of Illinois, the first of which was executed February 6, 1882, and the second, which is a modification of the former agreement in certain particulars, was executed on April 8, 1908. These two contracts are the ones identified in this record as City's Exhibits 60 and 61. The original contracts (City's Exhibit 60), as modified by the supplemental contract (City's Exhibit 61), is now in force between the American Telephone and Telegraph Company and the Western Electric Company of New York.

Hereafter, when the Western Electric Company is mentioned, I shall be referring to the Western Electric Company of New York, unless the contrary be specifically stated.

1036 From 1916 to the present time, the Western Electric Company has been engaged chiefly in the manufacture of telephone apparatus and cable, the purchase and sale of supplies, and the sale of such manufactures to the Bell associated companies. The Bell associated companies consist of those companies with whom we have supply contracts. They are principally the Bell licensee companies, but there are some connecting companies with whom we have supply contracts that are included in this classification. During this period, the Western Electric Company has done business with other than Bell Telephone Companies, which has consisted of the manufacture of Western Electric telephone apparatus and cable for sale to the independent telephone companies in the United States, and to others. When
1037 the Graybar Electric Company began business in 1926, it took over this business, and since that time has sold to the independent telephone companies and others, and has purchased supplies of other manufacturers for resale to other customers, including independent telephone companies in the United States. The Western Electric Company during this period has also sold its manufactures to the International Western Electric Company, to the Northern Electric Company, and to the International Standard Electric Company for use in foreign countries.

The Western Electric has sold its manufactures of talking motion picture equipment to its wholly owned subsidiary, the Electrical Research Products, Incorporated, since the time that Company began business on January 1, 1927, down to the present time.

1038 I have prepared a chart, identified as Plaintiff's Exhibit A-75, which shows in skeleton form the corporate structure of the Western Electric Company and its principal subsidiary groups. This chart shows the duration and extent of the Western ownership, and includes the Bell Telephone Laboratories, Incorporated, of which the Western owns only 50 per cent of the common stock, and the Northern Electric Company, Limited, in which the Western owns only 43.6 per cent of the stock. I have not included in this chart any of the subsidiaries of subsidiaries. It does not include a large number of subsidiaries of the International Western Electric Company during the time that we owned it, nor does it include a large number of subsidiaries of the

1039 Electrical Research Products, Incorporated, which are now in existence.

The International Western Electric Company was formed to take over the foreign business of the Western Electric Company, and was first organized in 1882. During all of the time up to the date of its sale, it manufactured telephone apparatus and cable at various localities in Europe and other foreign countries, and also purchased Western Electric manufactures in this country for resale to its customers abroad. The Western Electric Company at all times owned 100 per cent of the International Western Electric Company. The International Western Electric Company in turn owned 100 per cent of most of its subsidiaries. In some other of its subsidiaries, it owned more than 50 per cent, and in some, less than 50 per cent.

1040 These companies, other than the Northern Electric Company, were sold by the Western Electric Company to the International Telephone and Telegraph Company on September 30, 1925. Since that date, the Western Electric Company has had no interest or ownership in this foreign

business, with the exception of its 43.6 per cent interest in the stock of the Northern Electric Company.

There was an interchange of patent rights between the Western Electric Company and the International Company and its foreign companies.

1041 During the entire period from 1916 to 1931, and down to the present time, the Western Electric Company has owned 43.6 per cent of the capital stock of the Northern Electric Company. The business of that latter Company has consisted, in the main, of the manufacture of telephone apparatus and cable, and the purchase of supplies for the Bell Telephone Company of Canada. It has also done quite an extensive supply business to the general trade in Canada and Newfoundland.

The Graybar Electric Company was organized in December, 1925, and began business January 1, 1926. The Western Electric Company owned 100 per cent of the stock of the Graybar Company from the date of its organization until that stock was sold to the Graybar Management Corporation, on December 31, 1928. The stock of the Graybar Management Corporation was owned by the employees of the Graybar

1042 Electric Company. Since December 31, 1928, the Western Electric Company's only interest in the Graybar Electric Company has been in some of its preferred stock, which is gradually being liquidated. The Western Electric ceased to have any ownership of any common stock of the Graybar Company on December 31, 1928.

The Graybar Electric Company is engaged in the distribution of Western Electric manufactures (cable and telephone apparatus), and in the purchase and sale of supplies of other manufacturers throughout the United States. That is substantially the same business, so far as that branch of it is concerned, as the Western Electric formerly carried on

1043 with its non-Bell customers through its Supply Department. The Graybar also sells public address equipment, and other non-telephone articles.

The Electrical Research Products, Incorporated, was organized in December, 1926, and began business January 1, 1927.

It is a wholly owned subsidiary of the Western Electric Company. It has never engaged in the manufacture or sale of telephone apparatus. The list identified as Plaintiff's Exhibit A-76 shows the classes of devices which are marketed by the Electrical Research Products. With respect to the several classes of devices shown on Exhibit A-76, the Electrical Research Products, Incorporated, has the right to use patents owned by the American Company or by the Western Electric Company.

1044 The Western Electric Company acquired the Teletype Corporation on October 1, 1930. That corporation is engaged in the manufacture of telegraph printing in-
1045 struments. Prior to October 1, 1930, the Western had no ownership, directly or indirectly, in the Teletype Corporation, but had been one of its customers.

The Bell Telephone Laboratories, Incorporated, was organized in December, 1924, and began business January 1, 1925. It is owned 50 per cent by the American Telephone and Telegraph Company, and 50 per cent by the Western Electric Company. It was organized to take over the development and research work formerly done by the Western Electric Company. It does development and research work for
1046 the Western Electric Company, for the American Telephone and Telegraph Company, and for the Electrical Research Products, Incorporated. The work done for these three companies is billed to the respective companies at cost, plus interest on the investment. That rate of interest is 7 per cent per annum.

The Western Electric Company has some other subsidiaries which I have not specifically described. It has a railroad (the Manufacturers' Junction Railway Company), which is a plant facility of our Hawthorne plant. It has a real estate company, which is owned in conjunction with the New York Telephone Company, at 395 Hudson Street, New York, and some other minor companies.

The instrument identified as Plaintiff's Exhibit A-77
1047 shows, for each of the years 1916 to 1930, the sales, total cost of sales, net profits, per cent net profits to sales,

average investment, and the per cent return on investment, on Bell business. The figures at the bottom of this exhibit, opposite the word "Total", are the aggregate amounts of the various figures appearing against each year. Thus, it shows that the per cent of net profits to sales on business done by the Western Electric with its Bell customers during this period has been 4.9 per cent; and that the per cent return on investment for the same period, and also in connection with its Bell business, has been 7 per cent. There are not included in the figures used in this exhibit, any profits on, or expenses relating to, any business done by the Western Electric Company during the years included in the exhibit with companies other than the Bell associated companies.

1048 On Exhibit A-77, under the column "Sales," is shown the aggregate of the billing to Bell Companies by years. Under the column "Total Cost of Sales," are shown the costs which have to be in part allocated or apportioned. In determining the cost of sales, the manufacturing costs of apparatus and cable sold to Bell customers are the same as the manufacturing costs of cable and telephone apparatus sold to non-Bell customers, and they require no allocation. They are direct costs. The installation costs are also direct costs. The remaining costs and expenses have to be allocated or apportioned. Where the time factor is involved, they have been divided on the basis of the time devoted to Bell business relative to the time devoted to non-Bell business. All other costs have been apportioned or allocated on the basis of the shop costs of sales. There has been deducted from the total cost, an item for interest received, which practically classifies itself without allocation. The interest received is principally on so-called Class C stock, representing returned goods from the Tele-

1049 phone Companies. There are also included Federal taxes, which, of course, are apportioned at the prevailing rate on the net profits previously ascertained from the application of the allocations I have mentioned.

The third column represents the difference between the first and second columns. The fourth column, "Per Cent

Net Profits to Sales," represents the relation of the third column to the first column. The fifth column represents "Average Investment," and the sixth column represents "Per Cent Return on Investment."

The average investment includes the cost of plant plus merchandise, plus receivables, plus cash, less accounts payable, and has been apportioned between Bell and non-Bell business on the following basis: the allocation of plant has been based on usage, as determined by the shop cost of sales. Merchandise in a great many cases is segregated for Bell and non-Bell customers, and requires no allocation, but where allocation is required, the merchandise is apportioned on the basis of shop cost of sales. Receivables classify themselves. Cash and accounts payable are apportioned on the basis of the purchases of plant and the shop cost of sales.

1050 In my opinion, the figures appearing in the column "Total Cost of Sales," reflect the direct and apportioned costs of the Bell business, as I have defined it, as taken from the books and records of the Western Electric Company. In my opinion, the apportionments and allocations which I have made are made upon a proper and correct basis. In my opinion, the apportionment of average investment is a proper one, and when the method which I have followed has been applied as I have applied it, it will correctly show the investment devoted to the Bell business in each of the years.

I prepared an exhibit, identified as Plaintiff's Exhibit A-78, which gives information similar to that contained in Exhibit A-77, but includes the year 1931, estimated on
1051 the basis of 8 months. This exhibit was prepared prior to the end of 1931. The 1931 figures were prepared by using the 8 months' figures, and adding 50 per cent to those figures to obtain the 12 months' figures. At the time Exhibit A-78 was prepared, the 1931 figures were not available, but have become so within the last week or 10 days. The actual figures for 1931 are as follows: under the column "Sales," the actual figure is $219,535,000; "Total Cost of Sales," $209,035,000; "Net Profits," $10,500,000; "Per Cent

Net Profits to Sales," 4.8 per cent; "Average Investment," $270,423,000; "Per Cent Return on Investment," 3.9
1052 per cent. The fact that the per cent of net profits to sales and the per cent of return on investment, as shown by the actual figures for 1931, are a trifle higher than those included in Exhibit A-78 (based upon the estimated year's results on the basis of 8 months), does not change the overall result shown at the end of this exhibit for the entire period. The effect of the difference between the estimated figures and the actual figures is so small in proportion to the total that it makes no change aggregating as much as .1 per cent. We have only carried our figures in this exhibit to the first decimal point, and that is not affected by this change.

In the preparation of Plaintiff's Exhibit A-78, the same methods of apportionment and allocation were used as in the preparation of Plaintiff's Exhibit A-77, concerning
1053 which I have just testified. The explanation which I have just given of the methods used in the preparation of Plaintiff's Exhibit A-77 applies equally to Plaintiff's Exhibit A-78. In Plaintiff's Exhibits A-77 and A-78, I have included all sales of telephone instruments made by the Western Electric Company to the American Telephone and Telegraph Company since January 1, 1916.

Plaintiff's Exhibit A-79 shows the sales, total cost of sales, net profits, per cent net profits to sales, average investment, and per cent return on investment of the Western Electric Company in its non-Bell business, for each of the years 1916 to 1930, and for the 15-year period. Exhibit A-80 shows similar information for the period 1916 to 1931. These two exhibits also were prepared under my supervision from the books and records of the Western Electric Company. In the
1054 preparation of these two exhibits, showing the results of non-Bell business, I have used the same methods of apportionment and allocation as I did in the preparation of Plaintiff's Exhibits A-77 and A-78, and the explanation about those exhibits applies equally to Exhibits A-79 and A-80, except, of course, that these two latter exhibits are in connection with non-Bell business, while A-77 and A-78 are in connection with Bell business.

In the preparation of Exhibits A-77, A-78, A-79 and A-80, which show sales, total cost of sales, net profits, per cent net profits to sales, average investment and per cent return on investment of the Western Electric Company in its Bell and non-Bell business, I have considered only the operating business of the Western Electric during the period involved.

There is one exception to this, and that is for the period 1055 1916 to 1925. There we have included the dividends and interest received from the Manufacturers' Junction Railway, from the 395 Hudson Street Company (our real estate company in New York), the interest on notes of the Bell Telephone Laboratories, Incorporated, during the first year of its operation, and some other minor items, aggregating in total $1,800,000. But aside from these items, I have not considered any non-operating income. In Exhibits A-79 and A-80 I included in non-Bell sales, all sales of the Western Electric Company to the Western Electric subsidiaries, as well as to outsiders.

In the instrument identified as Plaintiff's Exhibit A-81 appear several columns. The first column shows the years from 1916 to 1931 (1931 being estimated on the basis of 8 months plus 50 per cent). The second column shows the total sales of Western Electric manufactures to non-Bell customers during this period. The third column shows 1056 sales to domestic customers by our Supply Department prior to the organization of the Graybar Electric Company. The fourth column shows the export and foreign sales to the International Western Electric Company, Incorporated, and the Northern Electric Company, Limited. The fifth column shows sales to the United States Government, reflecting principally sales during the war years, since which time sales to the Government have been included in other classifications, as they are a relatively small amount.

In the next 4 columns are shown sales to distributors: Graybar Electric Company, Inc., from 1926 to 1931, inclusive; International Standard Electric Corporation; Northern Electric Company, Limited; and Electrical Research Products, Inc. The last column shows some minor sales to other customers.

In Plaintiff's Exhibits A-77, A-78, A-79 and A-80, the sales of the Western Electric Company in its non-Bell business, as shown in Exhibit A-81, have been included in the
1057 non-Bell business and excluded from the Bell business.

No part of the development expense incurred and paid by the Electrical Research Products is included in the development expense charged against Bell or non-Bell business in Exhibits A-77, A-78, A-79 and A-80.

During the period 1927 to 1931, the Electrical Research Products, Inc., incurred development expense in the conduct of its business, and likewise received royalties in connection with its business. A portion of these royalties were retained by the Electrical Research Products, and a portion of them were paid to other corporations and persons. The Western Electric Company during this period also received certain royalties, and paid portions of them to other corpora-
1058 tions. The International Western Electric Company, Inc., and the Western Electric Company, Limited, of Canada also received royalties from certain of their respective subsidiaries and others.

The statement identified as Plaintiff's Exhibit A-82 shows the income from royalties and patents sold, and expenses applicable thereto, of the several companies to which I have referred, and shows how these royalties have been distributed. This exhibit shows that information with respect to the period 1916 to 1931 in the first column, and like information for the period 1923 to 1931.

In the first grouping on this exhibit are shown the gross royalties received by the Western Electric Company, the Electrical Research Products, Inc., the International Western Electric Company from its subsidiaries, and those received by the International Western Electric Company and its subsidiaries from others. All of the gross royalties
1059 shown in this grouping are divided between the periods 1916 to 1931 and 1923 to 1931, and include the amount received for patents sold.

The second grouping shows the distribution of those gross royalties listed under the first grouping. There is shown the

amount distributed to the American Telephone and Telegraph Company under contract with it, and to the Vitaphone Corporation under contract with it. There is also shown the distribution to the Northern Electric Company, Limited, and to the International Standard Electric Corporation, and three other cases in smaller amounts. The balance retained by the Western Electric Company, the Electrical Research Products, Inc., and the International Western Electric Company and its subsidiaries after this distribution, is shown in the third grouping.

The fourth grouping shows the expenses applicable to the royalties received and patents sold, as incurred by the Western Electric Company on royalties and patents sold, as incurred by the Electrical Research Products in development expense, and as incurred by the Electrical Research Products
in other expenses. The last line shows the net royalties
1060 and patents sold, and represents the difference between the third group and the fourth group.

This exhibit is not a set up that relates itself to the Western Electric Company alone, or to any other of these companies alone. What I have done is to take the royalties received, not only by the Western Electric Company, but by the Electrical Research Products, and by the International Western Electric from some certain of its subsidiaries and by its subsidiaries from others. The groupings represent royalties arising from these various sources; the other groupings relate themselves also to the same corporate entities.

This exhibit shows, in the first column of figures, that for the years 1916 to 1931 there was an excess of $2,243,000 of royalties received and retained, above the development expense and other expenses applicable thereto. If this
1061 sum of $2,243,000 should be credited to the Bell business, the effect on the per cent of profit made by the Western Electric Company on its Bell business during the period 1916 to 1931, as shown on Exhibit A-78, would be .1 per cent. It would increase the profit on the Bell business from 6.6 per cent to 6.7 per cent on the investment for the period 1916 to 1931, as shown on Exhibit A-78.

The data compiled for the exhibits, showing the profits on the Bell and non Bell business of the Western Electric Company for the periods 1916 to 1930 and 1916 to 1931, were not compiled recently. They were compiled year by year. For instance, early in 1917 information was obtained as to the results of the business for 1916, and divided between Bell and non Bell business, for the use of the administrative officers of the Western Electric Company. That same method was followed in subsequent years right up to the present time. During this entire period of time, the rate of earnings made by the Western Electric Company on its non bell business was higher than the return made by it on its Bell business.

1062

There are four factors that caused the variations in per cent of net profits to sales, and in return on investment throughout the several years. The first factor is the per cent capacity at which our manufacturing plants were operated. If they are operating at full capacity, it tends to decrease the cost. Raw materials purchased have varied up and down during the period, and labor rates have shown a constant increase from 1921 up to recent years; this is particularly true of our productive labor rates. There is the further factor that, during all of this period, we have made reductions in prices to our customers. All of these factors taken into consideration, and with various weightings for the various years, result in the percentages shown as return on investment during this period. In my opinion, the results of a single year's operation are not representative of the Company's business, and to get a fair cross-section of that business we must take a number of years.

1063

A number of decreases and increases in prices have been made by the Western Electric Company to the Bell associated companies during the period 1916 to 1931. The prices on lead covered cable, being dependent largely on prices of copper and lead, have fluctuated with the prices of copper and lead. The prices of supplies have fluctuated as the costs of supplies have fluctuated. We made reductions in prices

of telephone apparatus from 1921 until November 1, 1930, when an increase was made.

The statement identified as Plaintiff's Exhibit A-83 shows the effect in dollars of the price changes made by the Western Electric Company in the years 1921 to 1930. This exhibit relates itself to sales of telephone apparatus, and does not include lead covered cable or supplies. The amount shown opposite each year on this exhibit represents the price change related to the volume of business in that particular year. They are not cumulative. Where a plus figure
1065 appears, it means that the price was more than it had been previously, and where a minus figure appears, it means that the price was less than previously. In one year (1923), there was a slight increase in prices, and in all of the years since, except in 1930, there was a decrease. In 1930 there was an increase.

If the 1921 prices of the Western Electric Company had been in effect in 1930, the Bell Telephone Companies would have paid $97,000,000 more for their purchases than they actually did pay in 1930. In other words, the 1930 prices were $97,000,000 less than the prices for 1921. This includes the effect of the 1930 price increase during the two months in which the price change was in effect. The percentage
1066 of reduction in prices during this period was slightly less than 40 per cent.

The instrument identified as Plaintiff's Exhibit A-84 shows the consolidated earnings of the Western Electric Company, including its subsidiaries and the subsidiaries of its subsidiaries, for the years 1916 to 1934. On the first line are shown the net profits for this period of $244,594,000. On the second line is shown the average investment of $3,229,000,000. The third line shows the per cent return on investment of 7.6 per cent.

1067 The average investment shown in Exhibits A-77, A-78, A-79 and A-80 includes the book cost of plant undepreciated, that is, the purchase price of the plant; it also includes the merchandise stock that we have on hand for use either for Bell or non-Bell customers, receivables due from

our customers and the amount of cash that we necessar-
1068 ily must have on hand for use in the business. There is deducted from the total of these items, the current accounts payable.

This investment was apportioned between the Bell and non-Bell business on the following basis: the book cost of plant is apportioned on the basis of usage of that plant, as determined by the shop cost of sales to the Bell customers and the non-Bell customers; for example: if we had a particular machine, the question was as to how we were to apportion the book cost of that machine. Say that 10 articles were made on that machine which were sold to Bell customers and 5 articles were made on it which were sold to non-Bell customers. Now, that would have a relation to the apportionment of the book cost of
1069 that machine. If 10 items of the same cost were sold to Bell customers, and 5 items of the same cost to non-Bell customers, two-thirds of that investment would be applicable to Bell business and one-third to non-Bell business during the period of time during which those sales were
1070 made. In the illustration just given, the investment in Bell and non-Bell business, respectively, changes slightly from year to year, depending upon the use of the machine relatively for Bell and for non-Bell purposes.

In determining what our investment was, we have not made any deduction from the purchase cost of the property. We made a study at one time to ascertain whether the plant, if reproduced new, less depreciation, would equal or be less or more than the book cost of plant. The facts concerning that study have been submitted to counsel on the other side.

1072 The investment of $3,229,000,000 shown on Exhibit A-84 includes not only the average investment of the Western Electric Company, but also the average investment of all of its subsidiaries and subsidiaries of subsidiaries. Where the Western Electric Company has owned less than 100 per cent of a company, the per cent of that investment representing Western Electric ownership is included.

This exhibit (A-84) includes, for the period of time shown on its face, that is, 1916 to 1931, all of the average investment on the basis I have described for the Western Electric
1073 Company, as well as that Company's earnings, whether operating or non-operating, and its interest in the earnings and investment of every corporation in which it owned 50 per cent or more interest, except that the Northern Electric Company, of which we own 43.6 per cent, is also included. Where the interest of the Western Electric Company in another company is less than 50 per cent and we do not control it, we have considered that as a sundry investment.

This statement (Exhibit A-84) shows all the earnings of the Western Electric Company and all of its subsidiaries
1074 during the entire period of time, related to the average investment, including either the whole of that investment or the proportionate part of it represented by Western's ownership. It shows that in the Western's business during this period of time, it has earned 7.6 per cent, whether those earnings are distributed or undistributed. It shows all of the earnings of the Western Electric Company and all the earnings of its subsidiaries, and the earnings of the subsidiaries of subsidiaries, to the extent of their ownership, where that ownership is in excess of 50 per cent. In the case of the Northern Electric Company, we have included its earnings to the extent of our ownership, even though that owner-
1075 ship is less than 50 per cent. It includes Western's profits, and, to the extent of its ownership, the profits of these other companies, whether those profits are held by the companies, or distributed by them to the Western, or distributed by it.

Since the sale of Graybar stock to the Graybar Management Corporation, as of December 31, 1928, the Western Electric Company's interest in the Graybar Electric Company has been confined to the dividends that it has received from the preferred stock in that Company. It has shared in the profits of the Graybar Company in the relation of the preferred stock to the total; that is, if it had 60 per cent of the preferred stock at the beginning, it had 60 per cent of the

net profits after certain deductions, but that percentage has gradually decreased as the preferred stock interest decreased. The preferred stock interest now held by the Western Electric is $4,000,000; it was originally $6,000,000.

1076 The earnings of the Teletype Corporation, which was purchased by the Western Electric Company on October 1, 1930, and the investment in that Company, appear on Exhibit A-84 for the period October 1, 1930, to December 31, 1931.

Exhibit A-85 shows the average investment and the average annual earnings of 88 manufacturing companies for the 6-year period 1925 to 1930, inclusive. To prepare this exhibit, we first examined the Standard Statistics Manual, which is an index of large industrial companies in the United States. We then went to Poor's and Moody's Manuals for the data. We eliminated from the original list of 579 companies those companies which were obviously not comparable with the Western Electric Company, such as extracting companies, mining and oil companies, railroads and public utilities.

1077 We also eliminated all steel companies, for, although they have extensive manufacturing interests, their other interests are also extensive. They are in the shipping business, the railroad business, and the mining business; it was impossible for us in any way to segregate that information and data from their total business. We further applied the test of size, eliminating all companies whose profits in the years 1925 to 1929, inclusive, amounted to less than $5,000,000, and whose income in more than one year fell below $1,000,000. We also made sure that there was enough information in Poor's and Moody's Manuals as to their depreciation and cost of plant to enable us to put them, as far as possible, on a comparable basis with the Western Electric Company.

After applying all these tests, we eliminated all of the original 579 companies except the 88 which are listed in Exhibit A-85.

On the second page of this exhibit (A-85), it appears that these 88 companies earned, during the 6-year period, 12.2

1078 per cent on investment. One of the tests which we had applied to arrive at these 88 companies was to make sure

that we had sufficient information on depreciation, so that we could make up the average investment on the same basis as we ascertained the average investment for the Western Electric Company. The average investment for all of these companies includes the book cost of plant, without deduction for depreciation.

The instrument identified as Plaintiff's Exhibit A 86 shows sales for all of the 88 companies where sales information was available. We could only find sales information for 38 of the 88 companies. This exhibit shows that, during this
1079 period of 5 years, the per cent profits to sales has been 11.6 per cent.

The tests for selecting the particular companies listed in this exhibit, to which I have referred, were applied for the period 1925 to 1929, inclusive, and the 1930 figures were added without attempting to apply the tests for that particular year.

This exhibit shows that, out of 88 companies included in Exhibit A 85, we could arrive at the per cent of net profits to sales for 38 of them, for the period 1925 to 1930, and during that time those 38 companies had earned 14.6 per cent on sales. The total figures in this exhibit are the actual figures for all of the companies, both as to sales and as to net profits; that is, the 38 companies during this 6 year period had $21,289,883,000 in sales, and earned $2,469,549,000 in profits.

1080 Plaintiff's Exhibit A-87 shows the ranking of those companies appearing on Exhibit A 86, and the Western Electric Company on its Bell business, during the same 6 year period with respect to the per cent of net profits on sales.

Plaintiff's Exhibit A 88 shows, in the first column, the years 1916 to 1930. It shows in the second column the per cent of sales of telephone apparatus to all Bell Companies to the total sales to all Bell Companies. In the third column it shows similar information for the Illinois Bell Telephone Company. The fourth and fifth columns show this information for lead covered cable, and the sixth and seventh columns for supplies.

1081 The second column shows, with respect to each of the years, the per cent which the sales of telephone apparatus to all Bell Companies bear to the total sales made by the Western Electric Company to all Bell Companies. The third column shows the per cent which the sales of telephone apparatus to the Illinois Bell Telephone Company bear to the total sales of the Western Electric Company to the Illinois Bell Telephone Company for each of these years, and the other columns contain similar information with respect to lead covered cable and supplies.

The sales of telephone apparatus to all Bell Companies for the years 1922 to 1931, inclusive, were 55.5 per cent of all sales to all Bell Companies. For the Illinois Bell Telephone Company for the same period, the sales of telephone appa-
1082 ratus were 59 per cent of the total sales to that Company. The sales of lead covered cable to all Bell Companies for the period 1923 to 1931 were 15.6 per cent of the total sales of the Western Electric Company to all Bell Companies for the same period; and for the Illinois Bell, were 15 per cent of the total sales to that Company. The sales of supplies to all Bell Companies for this same 8 year period were 28.9 per cent of all sales to all Bell Companies, and the corresponding percentage for the Illinois Bell was 26 per cent.

The second page of Exhibit A-88 contains the same information with respect to the year 1931, as appears on the first sheet with respect to the years 1916 to 1930, inclusive.

The Western Electric Company has done a large business in supplies with its Bell System customers during the period covered by Exhibit A-88. From 1916 to 1930, inclusive, the total volume of supplies sold to all Bell associated com-
1083 panies was about $915,000,000. The Western Electric Company made .8 of 1 per cent on all these sales of supplies, which amounted to about $7,000,000.

Exhibit A-89 shows the division of Western Electric sales to the Illinois Bell Telephone Company for the years 1928, 1929 and 1930, divided between telephone apparatus, lead covered cable and supplies, and further divided between the Chicago and State areas of the Company. The second page of

this exhibit shows similar information for the year 1931. The first grouping on this exhibit shows the total sales of telephone apparatus, lead covered cable and supplies for each of the years 1928, 1929 and 1930, and the per cent that such telephone apparatus, lead covered cable and supplies bear to the total sales for each of the years. The second group-
1084 ing shows that portion of the first grouping which was in the Chicago area, and shows for each of the years the percentage that telephone apparatus, lead covered cable and supplies bore to the total sales. The third group shows similar information for sales in the State area of the Company for the same years.

For instance, Exhibit A-89 shows, under the title "Chicago," a grouping for the year 1928, which, of course, totals 100 per cent, and means that the figures represent the total purchases on behalf of the Chicago area from the Western Electric of manufactured articles and supplies for the year 1928. Now, 59.5 per cent of those total purchases were telephone apparatus, 13.9 per cent were lead covered cable, and 26.6 per cent were supplies. That is the way the exhibit is set up, both for the Chicago and State areas, and for the Illinois Bell as a whole for each of these years.

Exhibit A-90 was prepared from the records of the
1085 Western Electric Company, and shows the sales of Western Electric manufactures for the years 1916 to 1930, and that part of the total sales represented by Bell business, both in dollars and as a percentage of the total. This exhibit shows the same information for supplies and for the total of both manufactures and supplies for the same period.

This exhibit (A-90) shows, in the last lines, a comparison of Western Electric sales for the 8 months of 1930 and for the 8 months of 1931, both of Western Electric manufactures and supplies, and of the total of the two. There has been a decrease in the sales for the first 8 months of 1931, as compared with the first 8 months of 1930. On Western Electric manufactures, there was a decrease of 38 per cent in the total, and 35.9 per cent on sales to Bell customers. On supplies, there

was a decrease of 44.5 per cent in total sales, and a de-
1086 crease in Bell sales of 44 per cent. The combined total of Western Electric Company manufactures and supplies shows a decrease for the 8 months of 1931, as compared to the 8 months of 1930, of 39.8 per cent for the total, and 38.2 per cent for Bell customers.

Plaintiff's Exhibit A-91 was prepared by me from the records of the Western Electric Company. It shows the book cost of plant facilities (which include land, buildings, service equipment, machinery, tools, furniture and fixtures), with the annual increases from 1916 to 1930, inclusive.

Plaintiff's Exhibit A-92 shows the owned factories of the Western Electric Company on June 30, 1931. It shows the locations of these factories and the dates of erection, acquisition, or major additions to them. It shows the kind of product manufactured at each of these 4 factories, which are: Haw-
thorne, Kearny, Queensboro and Point Breeze.

1087 The supply business which the Western Electric Company does with its Bell customers represents sales of goods purchased by the Western Electric Company from others. It consists of a large number of different items which the Telephone Companies use and which we do not manufacture, such as poles and pole lines, hardware, line wire, insulators, cross arms, conduit, furniture and supplies, directories, and miscellaneous items of a similar character.

The Northern Electric Company, of which I have spoken, is a Canadian corporation.

1088 In the consolidated balance sheet, which I have heretofore described, where the Western Electric Company has owned less than 50 per cent of some of the foreign companies, those companies have been considered as investments and not as consolidated with the Western. This was not true of the Northern Electric Company, where we included a proportionate part of its earnings, although we own less than 50 per cent. I am referring now to a few of the foreign subsidiaries of the International Western Electric Company that operated in foreign fields. When the Western Electric Company owned

less than a 50 per cent interest in them, we included
1089 merely the investment in our consolidated balance sheet.

In all other cases, including the Northern Electric Company (where the Western Electric Company owns less than a control) and the Bell Telephone Laboratories (where it owns 50 per cent), they have been treated by including whatever proportion the Western Electric Company owned in them. In these small subsidiaries of the International Western, of which I have been speaking, we included the dividends received, but not the earnings of such companies.

There was included in the consolidated earnings statement about $5,000,000 of the profit on the sale of the International Western Electric Company. The total profit made on
1090 such sale was $7,100,000. These foreign companies had been engaged in business abroad commencing in 1882, and had made earnings from that time down to the date of the sale as of October 1, 1925, of the International Western Electric Company to the International Telephone and Telegraph Company. I included in the consolidated earnings statement, that portion of the profit on the sale attributable to the period 1916 to 1925, determined by the proportion which the earnings in that period bore to the total earnings of all foreign companies, from the commencement of their business in 1882.

1093 F. O. HALE, called as a witness on behalf of the plaintiff, having been first duly sworn, testified as follows:

Direct Examination by Mr. Thompson.

My name is F. O. Hale. I testified on the former hearing of this cause, at which time I stated my qualifications and experience in the telephone business. I became President of the Illinois Bell Telephone Company on July 1, 1930, in which position I have continued to serve up to the present time.
1094 I am familiar with the exhibit marked Plaintiff's Exhibit A-64, and with the rate schedules which are shown

on it. If the Commission's rate schedule for the four-party coin box service had been put into effect, it would have resulted in a monthly rate about 46 cents lower than then existed in the City of Chicago. If that rate schedule had been
1095 put into effect, it would have brought in some additional users in Chicago, perhaps to the extent of 10,000 or 12,000 additional subscribers. I think it would have taken a period in the neighborhood of two years for it to have had its maximum effect in producing the additional stations.

If from 10,000 to 12,000 subscribers had been attached by reason of this reduced four-party coin box rate, they would have been marginal users to whom the rate was very important, and I would expect that we would have lost considerably more than one-half of them (from two-thirds to three-quarters) during the period 1930, 1931 and up to the present time. In my opinion, the gross yearly revenues from these additional subscribers would not have been, on the aver-
1096 age, over $28.00, on which the net telephone revenue would not have exceeded 10 per cent per station; that is, not more than 10 per cent of the $28.00.

I do not think that there is any doubt that the introduction of these additional subscribers would have reduced the net return which we have received without their being acquired, because at 10 per cent they are earning less of the gross than the average subscriber did during the period from 1923 on. The net of gross for stations that were attached during this period was from 15 to 16 per cent, on the average. The four-party coin box service, everything considered, is not
1097 actually more expensive per station, but is relatively more expensive.

I do not think that there would have been any increased message use by the existing subscribers to the individual business, two-party business, and two-party residence coin box services if the reduced rates fixed by the Commission had been put into effect for these 3 classes. Generally speaking, the use of the business subscriber is governed by the necessities of his business. Under the existing rates, he probably has used all that he would use. The telephone is an adjunct of

his business, and I do not think that his message usage is governed to any great extent by the excess message rate. This is true both of the individual business coin box and the two-party business coin box.

The case of the two party residence coin box service is one-
where again the usage is less free from cost considera-
1098 tion. It is a higher class of residence user, and if any-
thing happened there, I think that the reduction in the allowance of messages under the guaranteed rate would have tended to decrease the usage in that class of service rather than increase it.

We have assumed that there would be no change in the usage in these 3 classes (one-party business coin box, two-party business coin box, and two-party residence coin box), which, I think, is a maximum allowance.

In the two-party residence coin box, the Commission's order reduced the number of messages guaranteed per month from approximately 76 to approximately 67. We have assumed
that the usage in this service would remain the same
1099 under the new rates, even though the guarantee has
dropped, and even though our belief is that the guarantee is a controlling feature, at least in residence use, and that, especially in the lower classes of residence use, the number of messages allowed by the guarantee has a great deal to do with the average usage per station. The tendency here would have been to reduce the usage in the two-party residence coin box service, although we have not assumed that that would be reduced at all.

Exhibit A-65 is a study showing the effect on the message usage of the existing subscribers in the four-party residence coin box service if the Commission's rates had been made effective. It also shows the regrading from the two-party measured residence to the four-party residence coin box service if the rates had been made effective. This exhibit shows the expected usage resulting from these changes in the rates. I am familiar with this exhibit and with the underlying data upon which it was based, and in my opinion, it

correctly shows what the result would have been had the Commission's rates become effective; I think it is as
1100 good an estimate as could be made of what the usage would be.

When the decreased message usage had been ascertained, the amount of such decreased messages was furnished to Mr. S. S. Smith, Traffic Engineer of the Illinois Bell Telephone Company, who, in order to ascertain the savings in traffic expenses resulting from that decreased usage, applied certain coefficients to the decreased message use. I am familiar with the method used by Mr. Smith; it is a very simple calculation, and, in my judgment, is entirely accurate.

1101 I think there is an additional factor that should be taken into consideration, in the line at the bottom of Exhibit A-52, representing "Net Reduction in Net Income Under the Rates in Suit." This factor is the additional stations that might be attracted by the reduced four-party rate. As I have already stated, I do not think that the net income from these additional subscribers would have been more than 10 per cent of the gross from the stations. At $28.00 per station (the assumed gross revenue of these additional stations), and at 10 per cent of the gross which would result from
1102 this $28.00 per station, the net income would be around $30,000 per annum. Now, I want to make it clear that, in my judgment, that is the absolute maximum that we could expect from this. I am not at all sure that there would be any net revenue, but giving effect to the maximum that we could expect, I would put it for 10,000 stations at around $28,000 and for 12,000 stations at around $33,000.

These figures, if we are to assume the maximum result, should operate to reduce the figures appearing on the last line of Exhibit A-52, which is the net reduction from the rates in suit if they had been put into effect; that is, the reduction would not be as large by about $30,000. It should be borne in mind, however, that that $30,000 probably would not apply for more than 4 years, because it would take a couple of years to build up to the maximum number of stations that we would get with this reduced rate, and that type of station would

have been more affected during the depression. We have
1103 lost stations as it is, and we would have lost a greater percentage of those additional stations than we have of the stations which we now have. It would have been less than $30,000 in 1924, 1925, 1930 and 1931, in my judgment.

(Cross-examination deferred by agreement between the parties.)

RICHARD H. GREGORY, recalled as a witness on behalf of the plaintiff, having been previously duly sworn, further testified as follows:

1104 *Direct Examination by Mr. Thompson.*

MARCH 14, 1933.

The Western Electric Company has price lists for telephone apparatus and lead covered cable covering the
1105 period 1916 to 1931. The prices included in those lists are the same at any given time for all of the Bell associated companies.

The instrument identified as Plaintiff's Exhibit A-91 shows the book cost of plant facilities of the Western Electric Company, including land, buildings, service equipment, machinery, tools, etc., as of December 31, 1915, and as of December 31 of each year thereafter down to the end of 1930, and also shows the amounts added during each of the years. These plant facilities have been entered upon the books of the Western Electric Company and included in my average investment figures at their actual cost to the Western Electric Company.

1106 There is no item added in the column headed "Average Investment" in the Exhibits A-77, A-78, A-79 and A-80, for going concern value, good will, patents or development expense. On December 31, 1931, the Western Electric Company owned 4,276 patents, and was licensed under 4,775 patents. The Western Electric Company has received, during

the period 1925 to 1931, $695,000 in royalties from the Northern Electric Company, and this sum for the years 1925 to
and through 1931 has been reflected in Exhibits A-77,
1107 A-78, A-79 and A-80. The effect of this treatment of
royalties has been to reduce the expense entering into the cost of sales.

Prior to 1925, the Northern Electric Company paid a royalty to the International Western Electric Company amounting to about $279,000. That has been given consideration in Exhibit A-82, showing income from royalties and patents sold.

During the period 1916 to October 1, 1925, the Western Electric Company received $860,000 from the International Western Electric Company for supervisory and patent services rendered.

Exhibit A-81 shows sales by the Western Electric Company to the Electrical Research Products of something in excess of $46,000,000 for the period 1927 to 1931, inclusive. I have testified that the expenses of the Western Electric Com-
pany for its research and development work were spread
1108 on these manufactures, as well as other manufactures
of the Western Electric Company. Development expense, amounting to approximately $3,500,000, was included in the cost of these sales of $46,000,000 to the Electrical Research Products. The Electrical Research Products pays the Western Electric Company royalties on account of the releases by the American Telephone and Telegraph Company to the Western Electric Company of the right to sell restricted apparatus covered by patents of the American Company. During the years 1927 to 1931, inclusive, the royalties on account of these patents amounted to $1,493,000. The Western Electric Company paid this money to the American Telephone and Telegraph Company.

The International Standard Electric Corporation paid
1109 the Western Electric Company $918,000 on account of
royalties from October 1, 1925, through the year 1931. This sum, to the extent of the payment, has reduced the expense that has entered into the cost of sales in my exhibits.

Exhibit A-88 shows the per cent of sales of telephone apparatus, lead covered cable and supplies to total Western Electric sales to all Bell Companies, and shows similar information for the Illinois Bell Telephone Company for each of the years 1916 to 1930. I have given in my testimony the percentage relationship for the period 1923 to 1931. The same percentage relationship for the period 1916 to 1931
1110 is as follows: per cent of total sales of telephone apparatus to total sales to all Bell Companies, 53.7 per cent; per cent of total sales of telephone apparatus to total sales to Illinois Bell Company, 59.1 per cent; per cent of total sales of lead covered cable to total sales to all Bell Companies, 15 per cent; the corresponding figure for the Illinois Bell is 15.1 per cent; the per cent of total supplies to total sales to all Bell Companies is 31.3 per cent, and for the Illinois Bell, 25.8 per cent.

The classifications (telephone apparatus, lead covered cable and supplies) appearing on these exhibits are the three main classifications of the sales of the Western Electric Company. From 1916 to 1931, the Western Electric Company has made a different profit on sales and on investment in each of these three classifications.

I have prepared certain exhibits, identified as Plaintiff's Exhibits A-93, A-94, A-95, A-96; A-97 and A-98, which make certain comparisons between profits on sales and invest-
1111 ment of the Western Electric Company in its total business, and in its business with the Illinois Bell Telephone Company, and for a portion of the time with the Chicago area of the Illinois Bell Telephone Company.

Exhibit A-93 shows the sales, the per cent net profit to sales, and per cent return on average investment for the total Bell business and for the Illinois Bell business for the period 1916 to 1931, inclusive. It shows total sales on Bell business during this period in excess of $3,100,000,000, and shows Illinois Bell business in excess of $209,000,000. It shows that the per cent net profit to sales on all Bell business is 4.9 per cent, and the per cent net profit to sales on Illinois Bell business is 5.3 per cent. It shows that the per cent return on investment

for the whole Bell business is 6.6 per cent, and on the Illi-
nois Bell business, 7 per cent. This is for the period
1112 1916 to 1931, and includes not only sales of manu-
factured articles, that is, telephone apparatus and lead
covered cable, but also supplies, both for the Illinois Bell
and all Bell associated companies.

Exhibit A-94 shows in total the same figures shown on Exhibit A-93, and a breakdown both on the Bell business and the Illinois Bell business between telephone apparatus, lead covered cable and supplies.

Exhibit A-95 corresponds to Exhibit A-93, except that
1113 it covers the period 1923 to 1931, whereas Exhibit A-93
covers the period 1916 to 1931.

Exhibit A-97 shows the sales, per cent profits to sales, and per cent return on average investment for the total Bell business and for the Illinois Bell business in the Chicago area for the period 1928 to 1931, inclusive. It shows that the total sales on Bell business during this four-year period amounted to slightly less than $1,200,000,000, and sales to the Chicago area of the Illinois Bell Telephone Company amounted to slightly in excess of $49,500,000. The per cent net profit to sales on the Bell business was 4.8 per cent, and on the business of the Illinois Bell in its Chicago area was 4.5 per cent. The per cent return on investment for the total Bell business during this four-year period was 6.3 per cent, and the return on the Illinois Bell business in its Chicago area was likewise 6.3 per cent.

Exhibit A-98 is the same sort of breakdown or explanation of Exhibit A-97 that Exhibit A-94 was for Exhibit A-93.

This exhibit (A-98) shows such a comparison for the
1114 years 1928 to 1931. The available data for the purpose
of making such a comparison on the basis of profit on sales and return on investment on all sales of the Western Electric in its Bell business and sales for the Chicago area is limited to this four-year period.

In all of these exhibits (A-93 to A-98), the figures have been prepared on the basis of profits on sales and return on

investment both in the total Bell business and in the business done with the Plaintiff Company in the Chicago area on the basis of these three general classifications: telephone apparatus, lead covered cable and supples.

As plant facilities are retired from use by the Western Electric Company, the book cost of such retirements are taken out of our fixed investment. In the years 1924, 1925, 1926
and 1927, the Western Electric Company accrued an
1115 extraordinary reserve against plant in an amount
slightly in excess of $8,200,000. In reviewing the situation at that time, it was felt that the costs of construction of the buildings, service equipment and machinery, were high, due to the great activity then existing throughout the United States. It was felt that it was wise and sound that this period should stand some of that excess cost of construction. An estimate was made of the cost of reconstructing the plant during the period 1931 to 1940, and the difference between that estimate and the cost as shown on the books at the end of 1927, which amounted to $8,200,000, was charged to the cost of sales. If this amount had been treated on Exhibit A-78 as plant retired and written out of the plant accounts, it would have increased the return on Bell business by approximately
.3 per cent. The result of the same computation applied
1116 to the earnings on investment in Bell business during
the period 1923 to 1931 also would have increased the return on Bell business by approximately .3 per cent.

When the Electrical Research Products Company was organized, the Western Electric Company transferred to that company an option which the Western Electric Company had acquired to purchase the stock of the International Telephone Sales and Engineering Corporation. The International Telephone Sales and Engineering Corporation was a holding company owning a controlling interest in the Automatic Electric Company, which was engaged in the manufacture and sale of telephone apparatus and equipment. There was a contractual relationship between the Automatic Electric Company and

the Western Electric Company, commencing in 1919 and continuing down to the present time (the expiration date of
1117 the present contract is December 31, 1936). The present contract with the Automatic Electric Company provides for a minimum annual purchase of $2,600,000 of automatic equipment from the Automatic Electric Company.

This option was surrendered by the Products Company to the original owners May 26, 1927, for a consideration of $4,000,000 paid in installments. If this figure were to be given
1118 effect in Plaintiff's Exhibit A-78, we would first have to take into account the period of 17 years during which there were contracts between the Western Electric Company and the Automatic Electric Company. We should also have to take into account the Federal Income Tax on such amount. If this amount were to be treated as a credit to Bell business, it would result in a net credit of $2,900,000 and would increase the return on investment in the Bell business shown on Exhibit A-78 by .1 per cent. It would also increase profits on Bell business for the period 1923 to 1931 by .1 per cent.

If all of the amounts involved in the extraordinary reserve accrued from 1924 to 1927, and in connection with the Automatic Electric Company, and in connection with the ex-
1119 cess of royalties and patents sold shown in Exhibit A-82, were treated as credits to Bell business, they would have increased the rate of return shown in Exhibit A-78 from 6.6 per cent to 7.1 per cent for the period 1916 to 1931 inclusive. The same sort of calculation for the period 1923 to 1931, inclusive, would have increased the return on the Bell business from 7.1 per cent to 7.7 per cent.

(Exhibits A-93 to A-98, both inclusive, were offered in evidence by plaintiff. Right to object was reserved until after conclusion of Mr. Gregory's testimony.)

Cross-Examination by Mr. Goldstein.

I have some documents, prepared at the request of counsel for the defendants, and which I have submitted to them, entitled "Analysis of Cost of Sales to Bell and non-Bell Customers."

(The following documents were identified by defendants: Defendants' Exhibit D-19, "Analysis of Cost of Sales to Bell and Non-Bell Customers"; Defendants' Exhibit D-20, 1120 "Analysis of Cost of Sales of Telephone Apparatus to Bell Customers"; Defendants' Exhibit D-21, "Analysis of Cost of Sales of Lead Covered Cable to Bell Customers"; Defendants' Exhibit D-22, "Analysis of Cost of Supplies to Bell Customers"; Defendants' Exhibit D-23, "Analysis of Cost of Sales of Western Electric Manufactures to Non-Bell Customers"; Defendants' Exhibit D-24, "Analysis of Cost of Sales of Supplies to Non-Bell Customers".)

These are correct copies.

On Defendants' Exhibit D-19 is a column headed "Additions to Employees' Benefit Fund", both under Bell 1121 Customers and Non-Bell Customers. The sum of $2,000,000 shown under this column for Bell business for the year 1924 is the total amount included in the cost of sales, but these columns do not in all of the later 1122 years represent the total amount that is included in the cost of sales, as additions to the pension fund have been included in other costs. The pension fund plan was started in 1906, from which time up to and through 1923, the amounts were set aside by action of the Board of Directors without any actuarial studies. Beginning with 1924 and up to the present time, actuarial studies have been made, based on censuses taken at two-year intervals; that is, 1931, 1929, 1927, 1925 and 1923. As a result of these actuarial studies, the Board of Directors and the officers of the Company have ascertained the amounts which should be included in the cost of sales. Of course, as we have gone on from year to year our experience has grown. We have found that for the first two years there is not enough information to know what the

trend is going to be, but as we go on we get more ac-
1123 curate information. If we should go back now and do the thing over again on the basis of our present information of service life, service of employees, the age of employees, and the salary or wage level (which has been increasing during this time), and other data that we have, the amounts that we would set aside would be increased over the amounts that we have actually set aside over this period.

I furnished the defendants two sheets, one entitled "Pension Fund Transactions" and identified as Defendants' Exhibit D-25, and the other entitled "Actuarial Computations of Required Pension Accruals, 1916 to 1930, and Minimum Fund Required", identified as Defendants' Exhibit D-26.

1124 "Q. As I understand it, when in 1924 you determined to deduct from operating income certain amounts for your pension fund accruals, you found that if you had gone back to 1916 and had made accruals on the actuarial basis, you would have had to take out of current income for those preceding years amounts aggregating around $8,200,000, is that correct; that is, you were short by 1924 amounts aggregating $8,200,000?

"A. That is approximately correct."

In the years 1925, 1926 and 1927 we did not make up the entire deficit resulting from the years 1916 to 1923. We
1125 made up a part of it. For the period 1916 to 1931 we have not accrued as much as we should have under our actuarial computations.

In the year 1925, we set aside $1,773,000 in excess of the amount that would be required under our actuarial studies; in 1926, $3,100,000; in 1927, $2,871,000; in 1928, $249,000; but we set nothing aside in excess of the requirements shown by the actuarial studies for the years 1929 and 1930. In 1924 we were short of the amount required under our actuarial studies by $209,000; in 1923 we were short $2,000,000; in 1922 we were short $1,500,000; in 1921 we were short
1126 $1,300,000; in 1920 we were short $1,044,000; in 1919 we we short $660,000; in 1918, $657,000; in 1917, $590,000; and in 1916, $391,000.

In the years 1925, 1926 and 1927, we made up about $7,744,000 of that shortage, which has been given effect in those years in Exhibits A-77, A-78, A-79 and A-80, but for the period 1923 to 1930 the amount charged in excess of actuarial requirements is only $5,784,000.

I have not computed the years 1925, 1926 or 1927 on the basis of only including in the operating expenses the amount which should have been set aside under the actuarial studies.

1127 The amount of $2,000,000 shown for 1924 was charged against apparatus sold to Bell customers and nothing was charged against the sales of supplies to Bell customers, or against the sales of manufactures or supplies to non-Bell customers. As I explained in my direct testimony, these statements, the reports and the figures year by year are the ones that we use currently and were made up currently for the use of the administrative officers of the Company. In the year 1924 we did not attempt to segregate this amount between Bell and non-Bell customers. In all of these
1128 exhibits we are showing the actual figures which were made up for administrative purposes in those particular years. If we went back now and made a redivision in the light of our present information, we would find some that we would add to the Bell business and some that we would subtract from the Bell business.

In the years subsequent to 1924, we made an allocation of the pension fund between Bell and non-Bell business. I
1129 am not sure, but I think that in making up the deficit in the years 1916 to 1923 in pension fund accruals it was done on the basis of the employees in 1916 for 1916, those in 1917 for that year, and so forth. It was done on the best estimate we could get. We had no experience up to 1924, so this was just an estimate without any check.

The pension fund accruals, beginning with 1924, are
1130 based upon actuarial studies. I know that the methods used by the operating companies of the Bell System

are the same as our methods. I am not an actuary, but, in general, I am familiar with the fundamental principles underlying these studies. The factor of future separation of the employees enters into the consideration of these studies. I cannot testify as to whether or not in the study of 1924 we assumed that the future separation of the employees of
1131 the Western Electric Company would presumably be substantially as it had been in the previous experience of the Company. I am not familiar with what we assumed as to the future separation of Western Electric employees. All of the data in this actuarial study were made up by the Chief Statistician of the Company, who is a former professor of mathematics of Brown University, and I am not familiar with the details of it. Mr. R. W. Burgess is the Chief Statistician of the Western Electric Company, and is the man who is familiar with the details of that study. Neither am I familiar with the studies subsequent to 1924.

1132 I know about the income tax returns of the Western Electric. Up to 1927 there was no law which allowed us to make any deductions for pension accruals. In 1927 an act of Congress was passed allowing accruals in the current year to be deducted as a current operating expense. We have followed the provisions of that law in our income tax returns since that time. Since 1927, we have deducted each year from current operating income the entire amount that we have paid the Trustee for that year's accrual under the pension fund, including the interest, because it is the amount that we have paid the Trustee.

I am familiar in general with the arrangement made by the Western Electric Company with the Bankers' Trust
1133 Company. Under that arrangement, the Western Electric Company has the right to advise the Bankers' Trust Company as to the investment of the pension fund accruals deposited with it as Trustee. Since the inception of that plan, the Western Electric Company has always advised the Bankers' Trust Company to loan those accruals to it on its unsecured notes.

The accruals contemplate that the fund shall have future earnings at 4 per cent compound interest. When we borrow the money from the Bankers' Trust Company, we pay
1134 5½ per cent interest. In the average investment appearing in these exhibits we have included the assets represented by the amount of the pension fund notes and have not deducted from the operating income the interest paid to the Bankers' Trust Company.

1135 The amount of extraordinary depreciation, to which
1136 I have heretofore referred, is included in the column "Additional Depreciation of Plant" in Defendants' Exhibit D-19, but there are other items besides. The deduction for extraordinary depreciation in the year 1924 was esti-
1137 mated on the extraordinary cost of additions prior to and in that year. I am not sure whether the index numbers were used in 1924. My recollection is that there was a study made in 1924, but I do not know whether it was reduced to writing. The study to which I referred in my direct examination was the one made in 1927.

The journal entry as of December 31, 1924, shows that the deduction of $1,562,000 was approved by the Board of
1138 Directors on March 17, 1925. The sheet which I furnished counsel for the defendants, showing the journal entry, bears the statement "Details on file in the General Accounting Department". That was seven years ago, but I am sure there were such details in writing in my department at that time; I do not know whether they are in existence now or not.

1139 The $1,562,000 written off in 1924, as I recollect it, was based on an estimate made by our Plant Engineer and Engineer of Manufacture as to the amount that should be written off as representing the excess cost of construction of the additions made during the previous period of years.

1141 The entry for December 31, 1927, is the one supported by a study. The entries for extraordinary depreciation of plant in that year were as follows: for Hawthorne: buildings, $469,000; permanent fixtures, $307,000; machinery,

$610,000; total, $1,386,000; for Kearny: $246,000 for buildings, $71,000 credit for permanent fixtures, and $241,000 for machinery, or a total of $416,000. This made a total deduction of $1,803,000, which was supported by a detailed study and was in accordance with the action of the Board of Directors in 1928.

1142 The sheet which recites "Details of journal entry for extraordinary reserve against plant, December 31, 1927" is a copy of a sheet which I made available to defendants.

(Which document was identified as Defendants' Exhibit D-27.)

1144 Journal entry 284 for the year 1924 does not recite "Extraordinary depreciation written off to profit and loss of December 31, 1924, to revalue buildings, permanent fixtures and machinery to estimated cost for the next ten years". It states "Extraordinary depreciation as follows—with details on file in the General Accounting Department".

1145 The statement "Extraordinary depreciation written off to profit and loss December 31, 1924, to revalue buildings, permanent fixtures and machinery to estimated cost for the next ten years" appears on the summarization that we have made of the whole study, and is my statement. That is, it is my conclusion from an examination of the books as to what should be charged off to depreciation. We have regular depreciation, but this represents additional or extra-

1146 ordinary depreciation of an entirely different nature from ordinary depreciation, in that it is for the purpose of setting aside a reserve for the excess cost rather than for obsolescence and wear and tear. The entry in the books of the Company for this expense does not give a full explanation of it. It is extraordinary depreciation.

1147 The journal entries do not give a full explanation of the details of this extraordinary depreciation reserve which I have explained, but the working papers from which I obtained the amount at the end of 1927, and which are really the controlling figures, are all here. These working papers

were not controlling in 1924, 1925 and 1926. In 1927 we determined this amount on a more careful study than
1148 we had made before. In that careful study we used index numbers of the actual cost and of the future cost, and compared the two index numbers and found there was this excess. We had previously written off various amounts, so it left for 1927 an amount to be written off representing the difference between the amounts that we had written off in 1924, 1925 and 1926 and the amount found by this study, so the balance was written off in 1927.

1149 By the Court:

This extraordinary depreciation does not represent depreciation in the ordinary sense of the word; that is, it is not depreciation for wear and tear and obsolescence. It is a reserve that was set aside for a decline in the cost of the plant, which we estimated would come in the future. We expected that we would be able to replace our plant in the period 1931 to 1940 at a lower figure than what it actually cost us, because it was perfectly evident that costs were extraordinarily high, perhaps due to war conditions. We were getting a large volume of business during that time, and getting the profits on that large volume of business, and we said, "It is fairer to charge this reserve against the profits at the time we are getting them rather than to make the lean years in the future stand the loss". That is anticipatory depreciation, all
1150 charged in four years for depreciation which would occur in the future.

By Mr. Goldstein:

In Defendants' Exhibit D-27, there is the entry "Extraordinary depreciation written off at December 31, 1924,
1151 to revalue buildings to estimated cost for next ten
1152 years". We made a study in 1927 and obtained this amount of $8,000,000, which it was necessary to write off. We then could deduct from that sum the amount which we had written off for previous years and get the amount to be written off in 1927. In using the words "for the next ten years" in connection with 1924 entry, I had in mind the period of ten years following 1924.

1153 The journal entry for extraordinary reserve against plant, as of December 31, 1927, was determined by an estimate made that year of the requirements for this amount, against which was credited the earlier deductions. We also credited the excess over normal depreciation on Hawthorne's books, resulting from writing back at December 31, 1924, the excess war costs of gross additions which were written off in the years 1917 to 1920, inclusive. In those early years (and I think that it was prior to 1920), we wrote off of the face of the accounts $884,000 for excess cost of construction which we thought was due to war conditions. In 1924, in order

1154 that we might have our plant account in its entirety on a cost basis, we wrote that amount back into the face of the account, but took into account the effect of the depreciation on that particular amount during the period up to 1924. Therefore, the amount of the credit to depreciation reserve is not $884,000; but is $598,000, or a difference of $286,000. We did not add back this difference to the income account; it did not affect it. We charged $884,000 against operating income from 1917 to 1920, which wiped out that much plant. We figured that the $286,000 difference between the charge of $884,000 and the $598,000 restored to the books was normal depreciation on that item if it had been in the plant account.

The extraordinary amount was the difference between

1155 the two amounts, *i. e.*, $598,000, which is included in this amount of $8,233,000. There were no credits to any operating income.

The 1927 entry was based upon certain studies.

(Defendants identified copy of sheet which had been made available to them by plaintiff, entitled "Extraordinary reserve against plant to bring additions to estimated cost level for 1931 to 1940", as Defendants' Exhibit D-28.)

Defendants' Exhibit D-28 shows the cost of additions

1156 to the Hawthorne buildings from 1917 to 1927 and cost indices on the basis of the index of 1914 at 100. Thus the 1917 cost index for additions to the Hawthorne buildings was 153 per cent of 1914 as 100 per cent. In other words,

the cost level of the additions to Hawthorne buildings in 1917 was 53 per cent higher than if constructed in 1914. We determined for each year's additions the cost index, based on 1914 as 100 per cent, not only for buildings but for permanent fixtures and machinery.

It was then estimated that if the additions made to the Hawthorne plant in 1917, for instance, were in existence in the period 1931 to 1940, or if they were replaced in the period 1931 to 1940, they might be replaced for 2.6 per cent less than they actually cost in 1917. The index figure for the period 1931 to 1940 for these 1917 additions was estimated to be 149.

1157 That is the principle upon which the study is based. It is based on this assumption: if the same additions to buildings made in 1917 were replaced during the period 1931 to 1940, the replacement cost would be 2.6 per cent less than the actual cost.

Our regular depreciation plan is on the straight line method of spreading the cost, less salvage, over the period of the useful life of the property. We do not have a replacement reserve, but this extraordinary reserve is a reserve
1158 against decline in price of the construction of buildings, service equipment and machinery. We conceived in 1927 that if, during the period 1931 to 1940, we built $739,000 of additions, they would cost 2.6 per cent less than they did in 1917. This reserve was provided, not with the idea of replacing this plant in the period 1931 to 1940, but with the idea of finding out what it would cost to replace that plant if we had to replace it. We did not know in 1917 that we were
1159 ever going to replace these additions, and in 1927 we did not know whether we would replace those 1917 additions as of 1931. The basis of making that charge in 1927 was to charge during the period 1921 to 1929 or 1930 the excess cost of construction of our plant, because during that period we were having an extremely large amount of business placed upon us; our growth was very rapid, we were making large additions to our plant year by year, and we felt that

it was only sound and conservative business, exercising conservative business policy, to put into those years this excess cost of construction of that plant.

When I say "of that plant", I mean the excess cost
1160 of that plant upon the basis that the plant would be rendering service from 1931 to 1940. We were determining how much less that particular plant would cost during the period 1931 to 1940 than it did cost us during the period of its actual construction. I do not know whether the plant that was built in 1917 would be in existence in the period 1931 to 1940. We considered, in making this study, that all of the additions that we made during this period would be in existence during the period 1931 to 1940, in order to get at this difference in price level or cost level of construction. In making up this study, we assumed that the machinery
1161 we built in 1919 would be in existence during the period 1931 to 1940.

We depreciate the machinery on the basis of 10 per cent per annum; that is, based on a life of ten years. We had $219,000 worth of machinery added at Hawthorne in 1919, and ten years from that time would be 1929. What we were trying to do was to get the difference in the cost level between the period of these additions and the period 1931 to 1940.
1162 It is the purpose all the way through to get at the cost level in 1931 to 1940, and, in getting at that cost level, I assumed that it would be correct to take these additions and, on the average, compare them with what the cost level would be in 1931 to 1940, and in that way we would get at a correct amount.

We took the dollars to take care of this reserve out of operating income for the years 1924 to 1927. There is
1163 no cash involved in this transaction. We received the dollars from our customers.

What we did was to exercise what, in our judgment, was sound business judgment, in order to get this into this particular period. Now, whether you put that into the cost of sales, or whether it is a segregation of profit, is a debat-
1164 able point. The purpose of the deduction was to set aside a reserve to prepare for what we estimated would be a

decline in the replacement cost of buildings, service equipment and machinery in the period 1931 to 1940. This money was transferred to reserve and held by the Company to take care of this contingency. The Company has the money.

1165 What we did was to try to estimate what would be the
1166 replacement cost of these plant additions during the period 1931 to 1940. It is an approximation in any way you view it. No one knows what the prices in 1931 to 1940 are going to be. It is an estimate, but present conditions seem to indicate that maybe we were right in making that reserve and that there was some need for it. I would not say that we had such foresight in our organization that in 1924 we could foresee the conditions from 1931 to 1940, but we did feel that we were in a period of high prices, which were not going to continue. As a matter of fact, they kept on going higher after that than they were in 1924, and even after 1927 they were still higher.

1167 We felt as early as 1924 that the prices then current, and those current for a few years subsequent thereto, were not stable prices, taking into consideration a long period of time. The reason was, we knew that after periods of great wars (take the War of 1812), there was a period of great activity for ten years, and another period of ten years of lower activity. After the Civil War you get exactly the same situation, and we are getting the same situation after the last great war. Those past experiences indicate that point of view.

There is a footnote on the bottom of Defendants' Exhibit D-28, as follows: "Indices furnished by Mr. Lincoln as follows: Buildings and permanent fixtures, 4-2-27; Machinery, 10-14-26, 10-19-26, 12-15-26". I have these indices with me.

(Which said indices were marked for identification as Defendants' Exhibit D-29.)

In the year 1928, our records show a deduction from operating income for extraordinary depreciation of plant in
1168 the amount of $2,000,000, which is shown in the set-up which we furnished the defendants, marked Defendants' Exhibit D-19, in a separate column. In 1928, we made a study of the service life of our machinery. Prior to that time, we

had been depreciating machinery at 7½ per cent, but we were then in a period of great activity and making many improvements in our machine equipment, which made the machinery obsolete more quickly than had been our experience in the past. As a result of a study made by our Engineer of Manufacture, we found that the service life of machinery was really only ten years instead of fourteen years, so we changed our rate in that year, and also made a change for the previous three or four years, which aggregated a couple of million dollars. That amount we charged into the cost in that particular year, but it is really applicable to the previous years. In the light of our experience at that time, we saw that we had underdepreciated on machinery. For the purpose of
1169 our Exhibits A-77, A-78, A-79 and A-80, we made that deduction in the year 1928, because, of course, we could not go back and undo what had already been done.

I have here a copy of the statement, which I furnished defendants, showing the net increases in plant during the fifteen-year period 1916 to 1930, inclusive.

(Which said statement was marked for identification as Defendants' Exhibit D-30.)

I also have a statement, which I furnished defendants, showing the details of reserve for depreciation of plant during the fifteen-year period 1916 to 1930, inclusive, and showing gross additions to reserve and write-offs.

(Which said statement was marked for identification as Defendants' Exhibit D-31.)

I did not make any study in 1928 to determine the relation of the cost index of additions in that year as compared
1170 to the ten-year period of 1931 to 1940, nor did I make such a study in 1929, nor in 1930. I do not know what the relation of each of these years is to the index for the period 1931 to 1940. We stopped these deductions at the end of 1927, because we felt that this amount of $8,200,000 was an estimated amount and an approximation, and that if we made further studies, it would not make very much difference in the amount that we would feel should be written off. Of course, I do not know how much of the additions made in 1928.

1929 and 1930, will be in existence during the period 1931 to 1940 as compared with the additions beginning with 1917.

In 1928, we made additions amounting to $7,687,000. In 1929, we made additions of $40,000,000, and in 1930, approximately $29,000,000, or a total of approximately $77,000,000 during this period of three years.

1171 The total amount of the additions which we took into consideration in connection with the study leading up to the retirements from 1924 to 1927 appear on the details which we have submitted to the defendants, but are not summarized. That would be the additions from 1917 to 1927, as shown. They are gross additions.

1172 On Defendants' Exhibit D-31, we show a reserve in 1923 of $34,000,000, or 60 per cent of the total cost of the plant.

In 1930, a reserve of $66,000,000 is shown, or 40 per cent of the book cost of the plant.

The reserve against tools, furniture and fixtures in January, 1923, amounted to approximately $15,000,000, and increased to approximately $29,000,000 by the end of 1930. The

1173 depreciation reserve for tools, furniture and fixtures stood at 100 per cent of the book cost for these items for each year from 1918 to 1922, inclusive; at 95 per cent to 98 per cent from 1923 to 1927, inclusive; and at 100 per cent in 1928 to 1930, inclusive. That depreciation reserve was built up out of the charges against operating income, in addition to the charges for the extraordinary reserve.

The extraordinary deduction in 1928 was of an entirely different character than the deduction for the period 1924 to 1927. The 1928 deduction had to do with the understating in previous years of the amount which should have been charged against operating income for the normal depreciation of machinery under the straight line method.

We have no studies for the years 1928, 1929 and 1930 cov-

1174 ering the subject matter which was involved in the adjustments made in 1924 to 1927, and we made no such adjustments for those three years.

We made a study of the value of the property in 1927. We

then attempted to ascertain how our cost value of plant, as it stood on the books, would compare with our reproduction value less then existing depreciation. That is the practice that is followed, as I understand it, in telephone valuations. This was not made by outside appraisers, but by our own people; it was made by the Engineer of Manufacture on machinery, tools and fixtures, and by the Engineer of Plant on land, buildings and service equipment. It was carefully made by those individuals, not with the idea of proving it in Court, but for the purpose of satisfying ourselves as to what the result would be. If was gone into very carefully, and,

1175 as a result of that study, we ascertained that the amount of the reproduction value less existing depreciation was slightly in excess of the book cost of our plant at the end of 1927. I have sheets showing the details of that study.

(Which said sheets were marked for identification as Defendants' Exhibit D-32.)

The persons who made the study in 1927 on the reproduction value less existing depreciation of the plant were the two individuals that I have named; that is, the Engineer of Plant and the Engineer of Manufacture. In addition to these two individuals, estimates were made by the Chief Stat-

1176 istician in connection with the study for extraordinary depreciation.

The persons who held these same offices in those years were the ones who had to do with the studies which formed the basis of the deductions in 1924, 1925 and 1926. There may have been a change in the individuals. I am not sure, for instance, when the Engineer of Manufacture took his office. It may have been the predecessor of the present Engineer of Manufacture who had to do with some of the studies.

1177 I think undoubtedly the person who made the valuation study in 1927 had knowledge of the study of extraordinary depreciation of plant. I think he also undoubtedly knew about the study, or the causes that led to the deductions in 1924, 1925 and 1926. Whatever individual occupied the office at that time knew about it. I cannot tell whether the particular individual who made the study showing that the

valuation was above book cost in 1927 had knowledge of the previous studies indicating that the property would be worth less than book cost in 1931 without knowing the date on which the present Engineer of Manufacture took his office. I do not carry that in mind, but it was the Engineer of Manufacture and the Engineer of Plant who had to do with that.

1179 The three sheets showing the valuation of 1927 are all that I know of. There may be further details in the possession of the individuals. The note on one of these sheets, "Observed depreciation", is intended to cover the existing depreciation of the plant at the time this study was made, in the amounts shown under each classification of plant,

1180 from an examination by experts. The term "depreciation", as used in this connection, is supposed to be synonymous with the per cent condition of the property at that time. What was intended by this observed depreciation is the per cent condition of the property, being the difference between what the condition would have been if it were new and what it actually was found to be by a physical inspection. It was not intended to take into account the balance of service life, obsolescence or inadequacy, but just observed deterioration.

Our depreciation reserve is built up through depreciation charges computed on the straight line method such as

1181 the telephone companies use. These depreciation rates take into account, not only the factors determined by this observed deterioration or inspection, but also the questions of inadequacy, obsolescence, service life and salvage. Depreciation rates take into account factors other than those taken into account in determining what I call "observed depreciation".

We did not deduct in our original return for income taxes, as a deductible expense, any amount covering this extraordinary depreciation, but did deduct those amounts from operating income in the years in which they are charged in Exhibits A-77, A-78, A-79 and A-80.

1182 In computing the return on the 1931 investment, I used the average book cost of plant, the average cost

of equipment, tools, furniture and fixtures; it was all based upon book cost figures without any deductions of any kind. Of course, all retirements actually made were deducted, but we took the book cost of plant as it stood, without deducting the depreciation reserve. Our policy on tools, furniture and fixtures has been to maintain a reserve of 100 per cent against the cost value of these items. That is, in effect, writing
1183 off approximately between 20 and 25 per cent of the face value each year. That is a rate commonly used by the electrical industry for depreciation on such items, which are of short life, and of questionable value other than for the purposes for which they are made.

Our policy with reference to machinery at the present time is to depreciate at the rate of 10 per cent per year on a straight line basis, except the rod and wire mill, where the rate is 5½ per cent. Prior to 1928, we used depreciation on this item of 7.5 per cent per annum; as I recall it, the depreciation rate has been 7.5 per cent for machinery during all of the time until we made the change to 10 per cent.
1184 On tools and fixtures, we, in effect, maintained a 100 per cent reserve, although in some years it is a little less than 100 per cent.

We have consolidated our income tax returns with the American Telephone and Telegraph Company since 1918, and in each of those returns has been included the tentative return that we made at the first of the year. Later on we have had examinations by field accountants of the Treasury Department, and, as a result of these examiners' inspection, we have made an estimate of what adjustment would be necessary in our return. We have settled with the Government for the period from 1916 to 1923.

"Q. And in that settlement there was a determination that the amounts of depreciation charged as a deductible expense for those years was excessive?

"Mr. Thompson: To which question the plaintiff objects.

"Mr. Goldstein: We are testing the policy that they are using, and that they say is currently used.

1185 "Judge Wilkerson: Determined by whom?

"Mr. Goldstein: We are talking about the Internal

Revenue Department and the Western Electric. The Internal Revenue Department examined their books and their income tax returns from 1916 to 1923, and they settled with the Government.

1186 "Judge Wilkerson: Do you know anything about that?

"A. As I understand, the situation is this: we have made our return on the basis, tentatively, at first, on exactly what we had written off the face of the account. I went down to Washington, I think about 1923 to 1924, and we consulted with the Treasury Department as to what they would allow for small tools and furniture and fixtures, they have allowed on machinery and on buildings and on service equipment, and they said, 'You have got to spread those over a longer period of time than you are doing it.' They said a four-year period on tools and a six-year period on furniture and fixtures.

1187 So what that does, what the effect of that is, your Honor, when we make large expenditures for tools, as we did in 1929, when we had the large profit in that year, it means the Government says, 'You cannot charge it all up, but you have got to defer it to 1931 and 1932, as a deduction of income', and we could credit 1931 and 1932 for those particular items we filed in 1929. Now, our practice in this respect I know is exactly the same as the General Electric Company has followed. That is, they write off—I don't know how they make their returns for the United States Treasury Department, but it seems to me what the Treasury Department regulations are, are not determining as to what is sound policy in the company.

"Mr. Goldstein: And then subsequent to 1923, you filed amended returns that conformed to this understanding of the Revenue Department?

"Mr. Thompson: To which question the plaintiff objects, that they conformed.

1188 "Mr. Goldstein: When they show a comparison with other companies, and it appears that they are following one policy, and the other companies—

"Judge Wilkerson: Do you know what policy the other companies are following? Let's get down to that."

1189 I cannot testify as to what policy each of the 88 companies follows in respect to taking into account the rulings of the Internal Revenue Department. I do know about the General Electric Company, but I do not know, of my own knowledge, about any of the other companies. I had the exhibit which shows the 88 companies prepared; it was prepared from Moody's and Poor's. I do not know whether there appears in Moody's and Poor's any statement as to any company that it has its depreciation policy in conformity with the Internal Revenue Department's rulings. I do not know, because I have not examined those individual reports.

1194 The figures which I gave referred to taxable income and not to taxes.

(It was agreed by counsel that the following figures would be put into the record by the counsel for the defendants, as representing the difference between the depreciation charges allowed by the Government and those returned by the Western Electric, subject to check by the plaintiff: $364,000 in 1916, $1,031,000 in 1917, $591,000 in 1918, $239,000 in 1919, $1,400,000 in 1920, and $1,136,000 in 1921, the Western Electric Company being entitled to credits in the following years of $168,000, $44,000, and a debit of $77,000 in 1924.)

1195 Our returns for 1924 have not been finally checked by the Government, and there is still some contention between us.

1196 At the end of 1925, we sold certain assets to the Graybar Company, and a portion of our plant, which was carried on our books at approximately $897,000, as I remember. There was a depreciation reserve at that time of about $857,000 against that property. When the opening entries were made on the Graybar Company's books, the book cost of that property appeared in the amount of $897,000, with a depreciation reserve of only $443,000. The $411,000 difference between the reserve on our books and the reserve on the books of the Graybar Company was considered as a reserve against the stock of the Graybar Company. It had no effect whatsoever on the profits of the Company; we never took any profits on account of that reserve. We get dividends from the Graybar Company.

1197 The sale of the Graybar Company was made for $9,000,000. When we sold the Graybar Company, we carried that on the books of the Products Company, which is a wholly owned subsidiary of the Western Electric Company, at $8,500,000, which was after deducting certain values which we knew existed, but which we did not adjust to the reserve; that is, there was $119,000 for Habishaw receivables, which we had written off at 100 per cent previously, but which we recognized as good, and which were sold to the Graybar Company. There was about $275,000 of profit made on the sale of merchandise manufactured by the Western Electric Company that was still in the inventory of the Graybar Company. I do not think that has anything to do with the profit on the sale. In making up the account on the books of the Graybar Company, we had a reserve for bad accounts, which later proved to be excessive, as the Graybar collected more than the value we put in, so when you take all of these factors into con-
1198 sideration, what we did was to sell the Graybar Company for $9,000,000, which was approximately the cost to the Western Electric Company, regardless of all of these write-ups of plant or write-downs of plant, or anything of that kind.

When we sold the Graybar Company to the Graybar Management Company, the net amount for that investment was carried on the books of the Products Company, and amounted to about $8,500,000. This investment increased from $6,700,000, at January 1, 1927, to $8,500,000, at December 31, 1928, on the books of the Electrical Research Products Company by this means: the Graybar Company was owned 100 per cent by the Electrical Research Products, Inc., during the period 1926 to 1928, inclusive; therefore, the Graybar
1199 Company's undistributed earnings during that time were, in reality, the profits of the Electrical Research Products, Inc. This $6,700,000 did not take into consideration these undistributed earnings, so we wrote it up to $8,500,000 at the end of 1927, I think it was. This figure of $8,500,000 is the one I have mentioned before as the value of the Graybar Company as shown on the books at the time of

the sale. I have explained what should be added to the $8,500,000 to bring it up to $9,000,000. In other words, we sold the Graybar Company at approximately what it stood on our books.

When the Graybar Company was organized in 1925, the Western Electric Company had $15,000,000 worth of stock, against which it had a reserve of $8,300,000; I think that 1200 is correct. In that $15,000,000 of stock, there was an item put on the asset side of the ledger of $7,500,000 for good will, so that, in reality, we do not want to talk about $15,000,000 of stock; we want to talk about $7,500,000 of stock. The investment of the Western Electric Company in the capital surplus and open account of the Graybar Company at December 31, 1925, was $8,269,000. There was an open account there that the Western Electric Company had, in addition to the $6,700,000 which appeared on the Western Electric Company's books as the investment.

1201 What I said was that at the time the transfer was made to the Graybar Company, on December 31, 1925, the investment of the Western Electric Company in the capital, surplus and open account of the Graybar Company was $8,269,000. For that investment the Western Electric Company received $15,000,000 worth of stock, which included $7,500,000 of good will. It received $15,000,000 of stock, but I am not saying anything about what it was worth. The

1202 Western Electric Company carried on its books at January 1, 1926, the $15,000,000 worth of stock and $1,446,000 on open account at $8,105,000.

This $8,105,000 was arrived at in this way: the investment of the Western Electric in the assets transferred to the Graybar Company at the close of 1925 (that is the time they were transferred to the Graybar Company and the Graybar Company was organized) was $8,269,000. There was deducted from that amount $283,000 on account of reserves for incorporation and advertising expense and for Western's profit on the merchandise inventory of the supply department. Then there was also included $119,000, representing the Habishaw receivables at that time. These items resulted in an aggregate of $8,105,000 as the net investment.

I gave no effect at all on our books to the $411,000 of
1203 revaluation through the depreciation reserve. We considered our investment just the same as if the Graybar Company had never been formed.

It was sold to the Electrical Research Products for $6,700,000 on January 1, 1927. The difference between this $8,105,000 and the $6,700,000 is this: in 1926, the Graybar paid its open account to the Western Electric Company of $1,446,000, and then there was a minor item of $41,000, which brings down the value to $6,700,000. In 1927, we revalued that investment to take into account the undistributed earnings of the Graybar Company of $1,800,000, making our total investment in the Graybar Company at the time of the sale, as carried on the Products Company's books, $8,500,000. I have already given the explanation of the difference between that and the $9,000,000.

We transferred the same assets in March or April of 1930
to another corporation, called The Weco Corporation.
1204 That was transferred, as I recall it, without profit or loss to the Western Electric Company; I have not the figures in mind. It was transferred with the same reserve against it.

I want to correct my testimony in connection with the stock received from the Graybar Company. After the Graybar Company was sold to the Graybar Management Corporation, the only investment of the Western Electric Company, or of the Electrical Research Products Company, or of the Weco Corporation, in the Graybar Electric Company was preferred stock, which had been taken in part payment of the sale; the Graybar Company paid $3,000,000 in cash out of the $9,000,000 sale price. There has since been retired $2,000,000 of this preferred stock, so that at the present time the Western Electric Company, or the Weco Corporation (a wholly owned subsidiary of the Western Electric Company), owns $4,000,000 par value of the preferred stock of the Graybar Electric Company, against which there is no reserve on the books of either the Western Electric Company or the Weco Corporation.

1205 I have been talking all the time about the investment that we have had, which is after the deduction of all reserves. What we did with reference to the depreciation and plant in forming the Graybar Company, and in selling it to the Graybar Management Corporation, had absolutely no effect on the profits of the Western Electric Company. If we should collect all of the proceeds of that $4,000,000 of preferred stock, so that our entire Graybar transaction would be reduced to cash, the $411,000 of the reserve would not be transferred to surplus. There was no profit for the Western Elec-
1206 tric Company in this Graybar transaction. It sold for $9,000,000, regardless of write-ups which are put on the books and regardless of this good will item. It is complicated in this set-up, but the facts are that we sold the Graybar Company to the Graybar Management Corporation at approximately the book cost to the Western Electric Company, as shown on either its books or the books of its wholly owned subsidiaries.

$8,500,000 was the value at which the Graybar stock was carried on the Products Company's books prior to the
1207 sale, and $9,000,000 was the sale price. This difference of $500,000 is made up of these items, roughly: $119,000 of Habishaw receivables, which we considered of no value in appraising the value of the Graybar stock at $8,500,000, but which had value at that time, but, as we were selling the company, we did not bother to write it up at that particular time. It also included around $250,000, representing profit on sale of merchandise which was in the stock of the Graybar Company. Those two items together make $369,000. The Graybar Electric Company, while it was a 100 per cent owned subsidiary of the Western Electric Company, had depreciated doubtful receivables, and they had at that time a 1 per cent reserve for contingencies of that sort. Now, the Graybar Company, in the next year, collected more than the value
1208 of the receivables at the beginning of the year. Adding all of these things together, you come approximately to $9,000,000.

The transaction with Graybar had no effect whatsoever on

the profits of the Western Electric Company, or of the subsidiaries of the Western Electric Company, at any time, and it will have no such effect if we finally receive cash for the preferred stock.

We also made a sale of certain assets to the Bell Telephone Laboratories. The Bell Telephone Laboratories was organized in December, 1924, and began business January 1,
1209 1925. The Bell Telephone Laboratories was organized for the purpose of taking over the research and development work of the Engineering Department of the Western Electric Company. Prior to the commencement of business on January 1, 1925, we had an appraisal of the property made by Horace S. Ely and Company, a real estate appraiser in New York of recognized standing. After they had appraised the property, they reported a value, which was less certain deductions necessary to be made on account of foundations that needed to be strengthened, of approximately $2,650,000. Now, this $2,650,000 was practically the same as the cost value of the property at 463 West Street, where the Bell Telephone Laboratories is located. In other words, the increase in the value of the land had offset the depreciation in the buildings, which were put up in 1897 and 1899, and had offset also the depreciation of the service equipment included in those buildings.

There were also other items, such as machinery and small tools, and furniture and fixtures, on which we did not get an outside appraisal, but came to an understanding with the
1210 officials of the Bell Telephone Laboratories as to a proper valuation. We carried the investment in plant sold to the Laboratories on the books of the Western Electric Company (that is, cost less reserve for depreciation) at a lower figure than the appraised and agreed-upon values, so that we had made a profit on the sale of about $2,100,000. This sale was made to the Bell Telephone Laboratories, whose stock was owned 50 per cent by the Western Electric Company and 50 per cent by the American Telephone and Telegraph Company. The profit on that sale has not been included in these exhibits.

The reserve on the books of the Western Electric Company for these items stood at $3,188,000 at the time of the sale. When these assets were transferred to the Bell Telephone Laboratories, that Company set up on its books a depre-
1211 ciation reserve of $1,096,839. After we sold the Bell Telephone Laboratories, we had a balance in the reserve, which was credited eventually to surplus. It was not put in the books as a current earning, and does not appear anywhere in these exhibits, but it increased the surplus.

The Bell Telephone Laboratories charges depreciation on its plant as part of the costs which are included in the billings to the Western Electric Company and the American Telephone and Telegraph Company. The book cost of the plant on the books of the Bell Telephone Laboratories, upon which these computations are made, is the value of the plant
1212 based upon this appraisal with the reserve standing against it of $1,000,000. In the computations that are made to determine the depreciation expense of the Bell Telephone Laboratories plant, there is taken into account the book cost only, and not the book cost less any depreciation reserve.

MARCH 15, 1932.

1214 (The following documents were identified by the defendants: Defendants' Exhibit for identification D-33, Explanation of Reserve carried on Western Electric Company's books as of December 31, 1926, against Investment in Stock of Graybar Electric Company, Inc. Defendants' Exhibit for identification D-34, Statement of Assets and Liabilities of the Graybar Electric Company, Inc. Defendants' Exhibit for identification D-35, Book Value and Depreciation Reserve on Plant, on Books of the Engineering Department of the Western Electric Company as of December 31, 1924, compared with the Book Value and Depreciation Reserve as shown by the books of the Bell Telephone Laboratories, as of January 1, 1925. Defendants' Exhibit for identification D-36, Explanation of Reserve on Books of the Western

Electric Company as of December 31, 1926, against Demand Notes of Bell Telephone Laboratories.)

1215 The documents identified as Defendants' Exhibits D-33 to D-36, both inclusive, are correct.

A portion of the $40,000,000 net additions to plant in 1929 was constructed by the Western Electric Company, and, in varying amounts, portions of the additions in each year from 1916 to 1930 were constructed by it. The portions of additions constructed by the Western Electric Company itself 1216 would be in the class of some machinery, and tools and fixtures, also some service equipment and buildings.

The construction of machinery, tools and fixtures done by the Western Electric Company itself are placed on the 1217 books at the cost of the labor, material and loading applicable thereto, on a standard cost basis. In the term "loading" is included all the factors of manufacturing cost, except the hourly productive labor cost and the material cost. There is included therein a factor of depreciation. There is included in each of the items manufactured by the Western Electric Company and placed in its plant accounts, a factor for the depreciation of the plant which has produced that 1218 item. If you are going to get a true cost of anything that is produced in our plant, you must, of course, include part of the cost of the plant that is used in order to produce 1219 that particular item. Those items of cost are added to the cost of the plant.

The present depreciation rates applicable to buildings are from 3 to 4 per cent. We use an average rate for build- 1220 ings which takes into account the different construction of the buildings, and, as I recall, 3.5 per cent is the composite rate. On service equipment, the present depreciation rate is 5 per cent. On machinery, 10 per cent (except the rod and wire mill, where the rate is 5½ per cent, and on tools, furniture and fixtures we maintain a 100 per cent reserve. In addition to depreciation expense, we also make charges against the operating revenues for changes and repairs, which is a maintenance proposition.

The document identified as Defendants' Exhibit D-37
1221 is a correct statement of the amount of repairs and changes from 1916 to 1930.

On Defendants' Exhibit D-37 the changes and repairs are defined as follows: Changes consist of that work which changes the design of plant but does not increase its reproduction cost. Repairs consist of that work which restores plant to good operating condition but does not change its design nor increase its value above the cost of the equipment. This is intended to bring the property into good working condition.

In the 1927 study, which has been heretofore described,
1222 the reduction below 100 per cent condition was to bring the property down to an existing condition value. I should not think defects found by observed deterioration would be the kind of things cleared up through these items of expense, changes and repairs. As I have explained, the study of 1927 was a rough approximation of the conditions at the time, and I am not informed as to just how detailed an examination was made by the different individuals responsible.

I should not think that the kind of defects found by observation would be the kind of things that would clear
1223 through maintenance. I should think that the changes and repairs would bring it up to the condition it was in, and that this observed depreciation would be needed in excess of that.

I know that all of the 88 companies state the amount of their depreciation reserve in Poor's. I am not informed as to whether or not they state rates in every case or not, as I did not personally examine each of those companies individually. I do not know how many of them have their rates expressed in Poor's.

1230 In determining whether a machine should be replaced by another, we take into account certain factors, such as whether there will be a saving produced by the one machine over another. In that connection, we also use a cost study to determine the relative return which will be obtained from one machine as against the other. In these cost studies,
1231 we frequently use the sinking fund basis of depreciation. In determining the savings, we figure the present worth.

The column "Current Cost of Sales Before Interest and Expenses", on Defendants' Exhibit D-19, represents
1232 somewhere around 80 per cent of the entire cost of sales.

The difference between the sales price and the current cost of sales, before interest and expenses, is represented by the column "Gross Profit".

Plaintiff's Exhibit A-78 shows that the Bell business in 1929 was $372,000,000, and Exhibit A-79 shows that for the same year the non-Bell business was $38,000,000. The
1233 classification of customers in effect prior to the formation of the Graybar Company is shown on Defendants' Exhibit D-38. This classification was also in effect when we owned the International Western Electric Company.

The changes in this classification made since the organization of the Graybar Company to date are as follows: the companies under the Supply Contract, which are shown on D-38 as Associated Bell Companies and Non-Associated Contract Companies, are now called Bell Companies and they are combined. The Non-Associated, Non-Contract Telephone Companies in D-38 include connecting independent non-competing and independent competing companies, and are now, in so far as they have no supply contract with the Western Electric Company through the licensee companies, customers of the Graybar Electric Company. The other domestic customers, which include in this exhibit central stations, electric railways, industrial plants and other large users, electrical contractors and dealers, other dealers, steam carriers,
1234 miscellaneous, and the Government (except the Government Department, New York), are now customers of the Graybar Electric Company, with the exception that some of our sales to the United States Government are made direct.

There is now another classification, which is not included in this exhibit. This new classification represents our sales to aviation companies in this country, which were not in existence at the time that this classification was made up. As to the classification on D-38 "Exports" (sales to International Western Electric Company, Incorporated, Delaware): we sold the International Western Electric Company in 1925,

and our export sales now consist of sales to the International Standard Electric Corporation and to the Northern Electric Company, Limited, Canada.

The Electrical Research Products, Inc., was not formed until January 1, 1927. In 1929 it would be included as a cus-
1235 tomer of the Western Electric Company in a separate class by itself, under the distributors' class. It will now be included in the exhibit as a non-Bell customer.

The companies listed on Exhibit D-38, under the classification "Non-Associated Contract Companies", are what we now classify as connecting companies. They are either controlled by the licensee companies or have license arrangements with the various licensee companies, and guarantee a sufficient volume of business to warrant the Western Electric Company giving them licensee prices. The credit of these com-
1236 panies is guaranteed by the licensee companies. There are two other companies not owned or controlled with which this license arrangement is made. These companies are the Lincoln Telephone Company, located in Lincoln, Nebraska, and the Tri-State Telephone Company.

(Document furnished the defendants by plaintiff and entitled "Conditions under which we extend the benefit of the supply contract to Bell Connecting Companies" marked for identification as Defendants' Exhibit D-39.)

1237 The Western Electric Company now manufactures approximately 20,000 different items, involving over 100,000 different parts. That is a very rough approximation. There are 20,000 combinations, which we call completed apparatus. These 20,000 combinations are, in turn, composed of combinations of 100,000 various items. When we manufacture a piece part, or even when we manufacture a piece of telephone apparatus, we do not know at the time whether it may be sold to a non-Bell customer or to a Bell customer. On the other hand, 90 per cent of all of our manu-
facturers go to the Bell customers, so that our error, if
1238 any, is slight. It is impossible at the time of manufacture to know whether the piece being manufactured is going into a piece of telephone apparatus to be sold to a Bell Company or to a non-Bell Company.

1239 "Q. I want to know whether after the sales are made at the end of a year, at the end of a month, or at the end of a week, or at the end of a day, and shipments are completed,—can you or can you not tell how many of the piece parts manufactured by the Western Electric Company went into the items that were delivered, sent, during that particular day, that particular week, that particular month, or that
1240 particular year, to the Bell customers, and to the non-Bell customers? Will you answer that yes or no.

"The Witness: Why, it can be done, yes."

1241 To do that we would have to set up a most elaborate organization to trace every item of telephone apparatus sold and break it down into its piece parts and find out just how many piece parts went into that particular telephone apparatus. It would mean an immense amount of clerical work that would have no practical use in the business whatsoever. It would be a waste of money to do it. It probably would cost millions and millions of dollars, and I mean millions and millions of dollars, to do it. I am not exaggerating. Under present methods of operation of the Western Electric Company, we have no records that would enable us to determine that question.

1242 The three sheets which I furnished the defendants, showing an analysis of total sales from 1916 to 1930, the analysis of sales to Bell customers from 1916 to 1930, and the analysis of sales to non-Bell customers from 1916 to 1930, are correct.

(The documents referred to were marked for identification as Defendant's Exhibits D-40, D-41 and D-42.)

In 1929, we classified our sales between three main classes of products. One of these classes we designated as sup-
1243 plies, which are all those articles not of our manufacture but which we purchase from others as purchasing agent for the Bell System, and any other supplies that we have purchased for sale to other than Bell System customers. The supplies cover both Bell and non-Bell customers.

Another main classification is called apparatus, which includes all of the sales of telephone apparatus manufactured

by us to all customers, and which would include also the installation billing. The apparatus would also cover the special commercial products which we sell to the non-Bell customers.

In this discussion, when I refer to telephone apparatus,
1244 I will speak of it as telephone appliances, and when I speak of special commercial products, I will designate them by that term.

The third main class is lead covered cable, which is also sold to both Bell and non-Bell customers, and is self-explanatory.

I furnished defendants a sheet showing the sales of special commercial products by the Western Electric Company.

(Which said document was marked for identification as Defendants' Exhibit D-43.)

On Defendants' Exhibit D-43, the various kinds of special products indicated therein are further subdivided into
1245 details as to the particular items. They contain maybe 40 or 50 different kinds of items. These products are sold mainly through Graybar and Electrical Research Products, Inc., but to some extent directly to aviation companies.

I have the reports for 1929 for the Hawthorne plant, known as Q202-1, 202-2 and 202-4.

(The documents were thereupon collectively marked for identification as Defendants' Exhibit D-44.)

1247 "Mr. Goldstein: Now, Defendants' Exhibit D-44 for identification to Hawthorne—or of Hawthorne, shows, does it not, over 20 classes and over 100 sub-classes of items of appliances and of special commercial products which are sold, also the dollar sales and the varying amounts, and the varying kinds to Bell customers, to distributors, and then shows the standard cost of sales, is that correct?

"A. I do not know about the number, but that sounds—

"Q. I mean approximately.

"A. That sounds approximately correct."

1248 A similar report was made in 1929 at Kearny, also.

The plants other than Hawthorne also manufacture various classes of items, which are sold in varying amounts to various customers of the Bell System. There must be

variations between the ratios each Bell customer buys in each year as to each kind of item manufactured by the Western Electric as compared to the ratio of that item for every
1249 other Bell customer. I do not know how much these
1250 variations are. I have no knowledge as to whether or not each Bell customer buys the same ratio each month of each item as every other Bell customer purchases during the same month, but common sense would indicate that there must be variations. It is similarly obvious that the Illinois Bell, Chicago division, does not buy the same ratio each month, or each year, of each item purchased by every other Bell customer. The same is true of the State area of the Illinois Bell.

1251 There are certain items that are sold exclusively to Bell customers, and some items that are sold exclusively to non-Bell customers, and there are certain items that are sold both to Bell and non-Bell customers. It is probably true that of the items that are sold jointly to the Bell and non-Bell customers, the ratio of Bell to non-Bell purchases of every item is not the same for any month, or for any year.

We have not kept any record to enable me to say whether each Bell customer has purchased in any one year, or over a period of years, the same amount of each of the items manufactured by the Western Electric Company as every
1252 other Bell customer. Some special commercial products are sold directly to non-Bell customers, which classify themselves. Some, such as sound pictures and aviation equipment, are not sold to Bell customers at all. There are other special commercial products that are sold both to Bell and non-Bell customers. The ratio in which they are sold depends upon the needs of the customers.

The ratio of labor, material and overhead, which make up the cost of each item of telephone appliances and of special commercial products, is not the same as the ratio of labor, material and overhead that make up the cost of every other item of telephone appliances, or of special commercial
1253 products. The ratios change constantly from day to day, from hour to hour, from minute to minute, and it is an

impractical thing to attempt to get at the exact labor cost of any particular item. No manufacturing company ever attempts to do that sort of thing. It would be foolish for them to spend the money to do it, and so we have to adopt a system which will, on the whole, give us a true picture of the facts, which is all we need to carry on our business and conduct it efficiently.

If you take a long enough period, the ratio of the aggregate of labor, material and overhead making up the cost of the appliances as a class, will average themselves out with
1254 the ratio of the aggregate of the labor, material and overhead making up the cost of the special products as a class. The ratio as between those two classes of course varies.

Merchandise is sold by the Western Electric Company to telephone companies and other customers through the distributing houses, of which there are a great many, located in all sections of the country. The sheet which I have furnished defendants shows the locations of the factories and branches of the Western Electric Company as of December 31, 1930.

(Which said sheet was marked for identification as Defendants' Exhibit D-45.)

1255 There have been some increases in these distributing houses, but substantially the same conditions existed in the years prior to 1930. There has been a gradual growth in the business from 1916 to 1930, which involved adding new distributing houses.

The prices which the distributing houses charge the customers are established by the General Commercial Manager. They are made on the basis of studies of standard costs, the difference between standard costs and selling prices that are in existence, and are made after a study has been made
1256 of the probable results for the coming year. For instance, whenever there is a big increase in the volume of business, I make a study as to what the probable results will be with that increase in volume of business, or, if there is a decrease in the volume of business, or any change, as a result

of that study, with the prevailing price level, I will get an indication as to what the profits will be.

We have attempted at all times to make our prices reasonable to the Bell System customers and to make our profits reasonable. If we see by the increased volume of business that we are going to get a larger return on the investment than we should, then that information is passed on to the General Commercial Manager. He and I together make a joint recommendation to the President of the Company for a change in price downward in that particular instance. When the President makes his decision as to the action to be taken, the General Commercial Manager's job is to apportion that amount of reduction by classes of apparatus, which involves issuing a new price list, to be given to all of the licensee companies. The prices are related to what the costs are, or probably will be, of producing the classes of merchan-
1257 dise and the furnishing of a reasonable rate of return. That is what we attempt to do. It has a relation to the cost of the product.

The distributing houses get merchandise and services from the merchandising departments of Hawthorne and Kearny. They also get merchandise services from the equipment departments at Hawthorne and Kearny and from the installation divisions located at thirteen different places in all parts of the country. They are furnished with supplies from
1258 outside suppliers.

The merchandise departments of Hawthorne and Kearny furnish these distributing houses with Western Electric manufactured goods. I would say that probably all of the other items are shipped direct from the various factories throughout the country to the distributing houses or to the customer. The billing from the merchandising department to the distributing houses is at a price set by the Commercial Department in New York. That price, at the present time, is exactly the same as the price to the customer;
1259 that is, there is no difference in the price at the distributing houses and the price at the merchandising department.

The items of the equipment departments and installation divisions, which consist largely of labor, are billed to the distributing houses at cost, plus 6 per cent interest on investment. What we attempt to do in the case of installation is to get back our cost with interest on the investment. By "investment", I mean the amount of money that would be tied up in that particular operation of installing and equipment engineering. The equipment department has the same practice.

1260 My recollection is that there is very little in the way of supplies stocked by the merchandise department, as it is much more economical to ship those supplies directly to the distributing house from the factories where they are manufactured, or to the destination where the merchandise is to be used. In general, the billing by the factories to the merchandising department of Western Electric manufactures and also the billing by the equipment department to the merchandising department is, in each case, made on the basis of the standard shop cost. The billing from the equipment department to the merchandise department is based on cost, plus an interest item of 6 per cent on the investment.

1261 On the Exhibit D-19, the gross profit for Bell business is shown for the year 1929 as being approximately $49,000,000, and the gross profit for non-Bell business in the same year is shown as being approximately $11,900,000. That, in each instance, is the difference between the sales and the cost of sales shown in the column immediately following.

As the billing is made to the customers during the year, we figure item by item the price of the article and the standard cost of that particular article. At the end of the year, when we take inventory, we make adjustments which are neces-

1262 sary because of inventory revaluations, and we make adjustments, also, to cover the difference between the aggregate of all the standard costs during the year and the actual amount of labor, material and loading that has been expended during the year.

I have explained why we cannot get actual costs, so that the necessity of some standard is clearly evident. These

standard costs are based upon engineering or planning studies as to what a thing should cost at a particular time. That is checked by the actual conditions prevailing at the time, except that no adjustment is made for material. Material is taken at the standard material cost, and the total standard shop cost thus obtained is modified by any known changes in methods of manufacture which we may have in mind at the time.

1263 For instance, if we know that we have a new process which will reduce the labor item necessary to produce a certain quantity from 42 employees to 6 employees, that known item is taken into account in computing estimated standard costs for use in the prevailing period. That is the way, in general and very roughly, that we make up our standard costs.

Our standard costs consist of three factors. We take the labor cost which the Planning Engineer thinks will be proper for that particular item at the prevailing rate at the time.

Then, as I explained, when it has gone into manufacture,

1264 that is checked up in comparison with the actual cost.

The Planning Engineer takes into account all the knowledge he can get as to what the real labor cost will be in the production of that article in the immediate future. The standard labor costs have as their bases the piece rate currently effective on the operation for which standard cost is being computed. The labor rate thus ascertained is embodied in our standard cost and continues as the basic labor rate until some future study is made and the experience is checked; then the labor rate is revised again and becomes the standard rate until some further check.

1265 Those studies are not made for each particular week on the same day, or the same month. In a period of great activity we have at least 350 people who are doing nothing else but studying these conditions and finding out what the real standard costs are. It is a constant process with us, and from time to time, as we feel that the standard costs may be far away from the actual conditions, we make a complete study of all the standard costs, and use another level of standard costs in computing our basic gross profit.

How often a complete revision of the standard basic labor costs is made depends upon the circumstances. The present standard costs have not been changed for some time.

1266 The cost conditions were so unstable that we would not know what to change to if we did change them. I think that the present figures have been in force for three years.

Before the last change, I think the preceding basic labor included in standard costs had been in force either one or two years, I am not sure just which. These changes would run in intervals of from one to three years, but I do not think it would be longer than a three-year period.

The next element ~~that~~ enters into the shop cost of each product is the price of the raw material. In connection with raw material prices we try to avoid in our cost keeping the effect of changes from time to time in raw material prices.

1267 What we are after is to measure the efficiency of our manufacturing organization. If it is affected by changes in raw material prices, such as copper going up to 25 cents or down to 8 cents, we do not get the gauge that we want. For this reason copper is included in our present standard cost at 15 cents. I think the current quotations in the newspapers indicate what we are actually paying for copper; I think it is around 6¼ cents. I think we are buying some copper, but very little; we have a stock. The 15 cents standard copper price has been in use during this three-year period. I think that it is probably true that it has been in use since 1925, but I am not sure. I am not sure just how long the present standard lead price has been used, but it has been for some time.

1273 These figures for cost of sales before interest and expenses on Exhibit D-19 include the total actual labor cost during the year as shown by our payrolls. They also include the actual cost of material for the year and the total actual overhead during the year, and proper adjustments for inventory revaluations.

The standard cost of manufactured goods sold, telephone apparatus and special commercial products, is the same whether sold to a Bell customer or a non-Bell customer, and

therefore, requires no allocation whatsoever. The installation costs are direct, because they are done on a particular job. In addition to those two items of cost, there are development costs, distribution costs and Federal taxes. The
1274 current cost of sales before interest and expenses shown on Exhibit D-19 is the sum of labor, materials and overhead, the materials being subject to the customary adjustments that are made in taking inventory of a manufacturing concern. My reference to labor and material is to the labor and material of the plant as a whole.

Our books do not show the actual labor, the actual material and the actual overhead that go into each of the items that are sold to the Bell and non-Bell customers.

1275 We have standard costs and at the end of the year we make an adjustment between the actual labor ex-
1276 penses during the year and the item of standard labor which was used in the standard costs. The standard cost system is simply a tool and a mechanism that we use during the year to get approximate figures, which are adjusted at the end of the year to the actual labor that we have expended and the actual material at cost prices and the actual overhead, all adjusted for inventory revaluation.

In arriving at the cost of sales to the Bell customers we proceeded as follows: we took all the standard costs of all the items mentioned which make up the Bell business, and a portion of the adjustment to arrive at the actual cost which I have used in my exhibits. The method of allocation of gross profits and adjustment between Bell and non-Bell business
1277 requires the use of standard costs. My allocation is dependent upon the accuracy of the adjustment from the standard labor and material and overhead to the actual material and labor and overhead experienced during that period, and the extent of the adjustment is a vital factor in my exhibits.

To arrive at the Bell profits we have to make an adjustment between the actual price to the Western Electric Company of copper for the year 1929, and the basic copper price which we used in making up the material. Similarly, we have to make the same kind of adjustment for each of the years

from 1916 to 1931. In order to determine the amount of the adjustment, we have to know how much our basic copper price was during each year, and how much the actual price to the Western Electric Company was for that year:

1278 I know what the actual price of copper was during each of the years 1916 to 1931.

1280 At the end of the year we aggregate the standard costs for overhead for all of the items of the year and arrive at a single adjustment, which is spread over the Bell and non-Bell business according to the standard cost of each class of apparatus, *i. e.*, telephone apparatus, cable and supplies. There is included in the standard cost for overhead all of the items of manufacturing expense, except labor and material. That would include salaries paid to supervisors, changes and repairs, clerical help, depreciation, insurance items which enter into the rent, and so on. The overhead that goes into each item as manufactured enters by virtue of what we call "loading," and that loading is a per-
1281 centage of labor hours. The basic loading for overhead is changed as conditions change and warrant different rates; that depends upon the judgment of the Manufacturing Department. I would say that they are changed every year or so, but I am not sure of the exact length of time that elapses. It is frequent. I do not think that it would be two years at any time.

When we make a change in our standard cost for a
1282 particular item, it is for the purpose of bringing the assumed figures for labor, material and overhead in closer proximity to the actual conditions as we find them at the time when we make our study. It is based upon factors which we expect to exist in the immediate future.

We arrive at our actual shop cost by making certain adjustments to our basic gross profit figures.

The following are the items of expense incurred during the year 1929 and allocated between Bell and non-Bell
1283 business upon the basis of standard shop cost: development expense (which amounted in that year to approximately $11,000,000, of which amount $8,910,000 is allocated to

Bell business and $2,114,000 to non-Bell business), merchandising, and general expense. The allocation of Federal taxes does not depend upon shop costs, nor does interest re-
1284 ceived, except in part perhaps. The adjustments made to arrive at our actual gross profits from our basic gross profits are spread between Bell and non-Bell customers on the basis of standard shop costs.

We have allocated a portion of our plant on the basis
1285 of usage as determined by standard shop costs. We apportioned the plant on the basis of shop costs, because shop costs is our method of arriving at the use of the plant. I think almost all of the plant account was allocated on the basis of usage as determined by shop costs. A part of the inventory was apportioned between the investment in Bell and non-Bell business on the basis of standard shop
1286 costs. Cash and payables are allocated on the basis of standard shop costs of sales and the purchase of plant items.

Some part of the distribution cost would be direct costs. Those are expenses in connection with our distributing houses.
Direct costs of distribution would come under the mer-
1287 chandising expenses. The plant account, to a certain extent, was apportioned on the basis of standard shop costs and likewise the inventory and a portion of the cash and payables.

The cost of sales shown in the exhibits is the total cost, and includes shop cost and all other items. Federal taxes are allocated on the basis of the earnings in each class of business, after we have ascertained them through the method which I have described.

The larger part of the plant account is apportioned on the basis of the standard shop cost of sales.

1288 The unadjusted basic gross profits of the Merchandising Department for the year 1929 were $56,899,000. This represents $47,426,000 for telephone apparatus, $8,191,000 for lead covered cable, and $1,282,000 for supplies.

There is a gross profit on local shop manufactures of
1289 $321,000, which I have allocated all to telephone apparatus. There is a basic gross profit in the Installation Department of $105,000, which represents the gross profit and

remuneration on the direct expense materials. The entire
$105,000 has been allocated to telephone apparatus.
1290 Profit on sale of connecting blocks of $64,000 is allocated
to telephone apparatus. Miscellaneous profits and losses, totaling $6,000, allocated $2,000 to telephone apparatus and $4,000 to lead covered cable. (The witness agrees to prepare a statement showing all basic gross profits for year
1929 and submit same to counsel for the defendants.)

1291 In connection with "the Manufacturing Department surplus," there is an item called "Reduction to actual cost of productive labor and manufacturing expense, December 31, 1928, Hawthorne Manufacturing Department, $1,142,000". This was allocated $1,095,000 to telephone apparatus and $47,000 to lead covered cable. It represents the difference between the standard cost of labor and manufacturing expense that was used in these standard cost studies to get at the basic gross profits, and the actual cost of productive labor and manufacturing expense applicable to the opening inventory. The cable was manufactured in an entirely separate shop and practically allocates itself.

1292 In the same column and under the same sub-head appears the same thing for Kearny, Philadelphia Instrument Shop, Engineer of Manufacture, Hawthorne Merchandise Department, Kearny Merchandise Department, and Broadway, making a total reduction to actual cost of productive labor and manufacturing expense as of December 31, 1928, of $4,498,000, which was divided $4,335,000 to telephone apparatus, $160,000 to lead covered cable, and $3,000 to supplies. This adjustment is in different amounts for each of the manufacturing departments and for the merchandise departments. The Hawthorne Merchandise Department had an adjustment of $1,408,000; the Kearny Merchandise Department, $793,000; the Philadelphia instrument house, $51,000; the Kearny Manufacturing Department, $374,000; and the Hawthorne Manufacturing Department, $1,142,000.

1293 "Shop surplus on production" represents the difference between the standard costs and the actual costs of items that are delivered to our merchandise departments. It is what we call our output surplus account. It is the difference

between the standard costs used in the course of manufacture and the actual costs at the end of the year. In order to make the adjustment, we have designated it as "shop surplus on production".

The net aggregate of these adjustments for the year 1929, for all of the plants, including headquarters, was $2,238,000, which is shown in the red. This red figure indicates that instead of a surplus there was a deficit, or, in other
1294 words, that the actual costs were higher than the standard costs for the entire organization.

The Hawthorne Manufacturing Department shows an adjustment of $5,353,000 in the black, indicating that our standard costs were too high so far as Hawthorne was concerned. At Kearny, the adjustment of $6,178,000 is the other way, showing that the standard costs were too low at Kearny. The net amount of all the adjustments for the year 1929 was $2,238,000.

The standard shop costs were too low on telephone
1295 apparatus, but too high on lead covered cable by $351,000. At Hawthorne, the standard cost was too high by $4,575,000 for telephone apparatus, and too high for lead covered cable by $804,000, but too low for supplies by $26,000. At Kearny, the standard costs were too low for telephone apparatus by $6,636,000, and too high for lead covered cable by $458,000.

The statement at the end, on total surplus incurred, is the difference between the figure of $2,238,000, representing the deficit, and the figure of $2,859,000, covering the item "Eliminating reserve for moving expenses to be incurred in 1930", and amounts to $621,000. The moving expense is supposed to cover the expected cost of major moves that were
1296 anticipated at the end of that year. The major moves anticipated were in all plants. I have not the detail or anything to indicate how much of that was for Hawthorne, Kearny, Point Breeze, Philadelphia Instrument Shop, Queensboro Works or Headquarters.

There is an entry in connection with the same adjustment,

entitled "Manufacturing Department reserve for moving expenditures in 1930", which is in red by the same number of
dollars that it is in black in the Manufacturing Depart-
1297 ment surplus. That is to eliminate from this item of
surplus in the shop the reserve for moving expenses. We did not incur this expense in the year 1929; it says "to be incurred in 1930". It would enter into our figures in 1930, depending on whether we made a reserve at the end of that year.

The next items are some slight adjustments as follows: "Reduction to actual cost of productive labor and expense, December 31, 1929; Philadelphia Instrument Shop, $25,000, which was allocated to telephone apparatus; Kearny Merchandise Department, $50,000, allocated to telephone apparatus". This is our estimate of how much lower actual costs were than standard as they apply to the ending inventory.

There is an item "Change to 1930 bulletin for productive labor and expense loadings of December 31, 1929 inventories", which aggregates $3,882,000, allocated $3,860,000 to tele-
1298 phone apparatus, $21,000 to lead covered cable, and
$1,000 to supplies. When we change our bulletins that, of course, affects the inventory at the end of the year and in order to get the profits for the year, we have to take into account the effect of using the new bulletin in inventorying at
the end of the year. By a bulletin cost we mean a stand-
1299 ard cost. A bulletin is simply a list of various items,
showing the standard cost of each item. When we make a change of standard costs used in our accounting system, that means that if the bulletin at the end of the year at which we price our inventory is higher than the old bulletin, in order to get at the profits for the year we have to take into account
the difference between the two bulletins as it applies to
1300 the inventory. The adjustment is for the bulletin cost,
which is made up of three items, material, overhead and labor, and represents the changed conditions from what the former bulletin cost represented. That is, it is a change in the bulletin cost of the particular items manufactured. The adjustment figures show the effect of the difference between

the figure resulting from applying to the inventory the old bulletin costs and the figure resulting from applying to that same inventory the new bulletin costs.

1301 This adjustment shows the effect of the changes in each of the plants, and in varying amounts, as follows: Hawthorne Manufacturing Department, $1,111,000, divided $1,053,000 to telephone apparatus, $57,000 to lead covered cable and to surplus $1,000; Kearny manufacturing

1302 plant, $606,000, allocated $638,000 to telephone apparatus, $32,000 used on lead covered cable; $560,000 in black for Hawthorne Merchandise Department, of which $559,000 was allocated to telephone apparatus; $979,000 for Kearny Merchandise Department (which was the net adjustment representing a black figure, $986,000 on telephone apparatus, and a red figure of $7,000 on lead covered cable); there was an adjustment of $532,000 for Broadway (distributing houses), of which $531,000 was allocated to telephone apparatus. The total adjustment for the effect of the bulletin charge was $3,882,000, and was divided $3,860,000 to telephone apparatus, $21,000 to lead covered cable, and $1,000 to supplies. This all represents the effect on the 1929 inventories of the change in the bulletin, and does not involve the process of going back to the first of the year.

1303 That disposes of the Manufacturing Department surplus, which had a net adjustment of $1,162,000. There was a surplus for the total plant. This is made up of a surplus of $481,000 for telephone apparatus, $862,000 for lead covered cable, and a deficit of $181,000 for supplies.

The general rule is that we apportion these adjustments of the Manufacturing Department surplus on the basis of the total aggregate standard costs of each class of appa-

1304 ratus: telephone apparatus, cable and supplies.

"Current under-run" represents the difference between the standard cost of material and the actual purchase cost of material to the Company. The current under-run

1305 is when the actual cost is under the standard, and is shown in black figures. For example, if we have a standard cost of 15 cents for copper and we buy copper for 8 cents,

the 7 cents difference is a current under run and is shown in black. When we have an under-run, the standard assumed cost of material was too high. Whenever there is a black figure in connection with this adjustment, it means the standard cost was too high, and it is called an under run. A red figure is called an over run, and means the standard cost of raw material was too low.

The first item of adjustment for current under run is "Adjusting raw material from 1929 standards to actual 1306 costs" for material on the December 31, 1928 inventory.

The adjustments under this item are as follows: in the Manufacturing Department, $797,000 total, of which $706,000 was for telephone apparatus, $98,000 for lead covered cable, and $7,000 in the red for the supplies. In the Merchandising Department, the total under run was $486,000, made up of $436,000 for telephone apparatus, $56,000 for lead covered cable, and $6,000 in the red on supplies. For Broadway (distributing houses), the total of $215,000 is made up of $139,000 for telephone apparatus and $76,000 for lead covered cable. The total adjustment was $1,498,000, made up of $1,281,000 for telephone apparatus, $230,000 for lead covered cable, and a red figure of $13,000 for supplies. We arrived at these adjustments in the following manner: we currently kept a record of the cost of our purchases and compared those costs with the standard costs of the materials. We know from month to month exactly what the current under-run is on all our purchases, and this is the adjustment which arises out of the information which we have currently kept.

1307 What I have spoken of before is the adjustment of the raw material prices as they apply to the beginning inventory. The next item, "current under-run incurred", is in connection with scrap sold and used and Class B and raw material and miscellaneous items purchased during the year. The adjustment of "current under-run incurred" aggregates $772,000 for all of the plants and shows that the standard costs were too high. This aggregate figure is composed of $2,459,000 for telephone apparatus where the standard costs

were too high, and $1,115,000 for standard costs that were too low on lead covered cable.

1308 If I mention "estimates" while speaking of this subject, I have in mind the estimates that enter into shop costs; I mean standard shop costs.

The term "Class B" means material that is returned from the telephone companies to be disposed of by the Western Electric Company as scrap.

1309 The total adjustment for the item "difference between standard value and shop cost of raw material produced" is $117,000 in the red, and shows that the standard shop cost was too low. Of that total figure, $111,000 is for telephone apparatus and $6,000 is for lead covered cable.

The allocations of these over runs and under-runs between telephone apparatus and lead covered cable were determined in exactly the same way as I have described before. That is, on the aggregate of the standard shop costs. The allocations were based on total costs, one as against the other. Of course, the under runs for lead covered cable go directly against cable. The allocation between Bell and non Bell customers is on the basis of shop cost of sales of telephone apparatus and cable.

1310 Under "Change in standard raw materials and scrap prices, 1929 to 1930 bulletin, on December 31, 1929 inventory" is shown, in the Manufacturing Department, that the standard costs were too high by $752,000. This is made up of an under-run of $768,000 in telephone apparatus, an over-run of $17,000 in lead covered cable, and an under-run of $1,000 in supplies. In the Merchandise Department, the standard costs were too high by a total of $58,000, composed of an under-run of $61,000 for telephone apparatus and an over-run of $3,000 for lead covered cable. The determination of this was a matter of computation. It is for the purpose of making adjustment for the two bulletins, which are different. These bulletins were bulletins of standard raw material prices. When you get the standard, it is different, so
1311 you have to get a different item to compare the actual with.

The next item is "Adjusting raw material from 1930 standards to actual cost." Under that heading, the Manufacturing Department shows a total figure of $346,000 in red. This
1312 is made up of a black figure of $58,000 for telephone apparatus and a red figure of $325,000 for lead covered cable, and a red figure of $79,000 for supplies. This means that in the particular year the standard prices for materials used in lead covered cable in the ending inventory were $325,000 lower than the actual prices and telephone apparatus standard prices were $58,000 higher than the actual prices paid. The Merchandise Department shows a total figure
1313 of $55,000 in red. This is made up of a black figure of $38,000 for telephone apparatus, a red figure of $42,000 for lead covered cable, and a red figure of $51,000 for supplies. If the figure is in black, it means that the standard cost is higher than the actual cost. That is, there is an under-run.
1314 The effect of an under-run would be to increase the basic gross profits. Wherever there is a red figure, the effect would be to decrease the basic gross profits. These effects, however, would be opposite when applicable to ending inventories.

The next item is "Effect of current under-run on beginning and ending inventories at engineer of manufacture not considered in M 2.01-5 report, but included with inventory revaluations." Here are balancing figures of $22,000 each way for apparatus and lead covered cable, resulting in a total of zero.

The total adjustments for the entire plant in the year 1929 resulted in a $1,849,000 under-run. That is, the adjustments increased our basic gross profits by $1,849,000. For telephone apparatus the current under-run was $2,793,000, increasing our basic gross profits for apparatus by a like amount. On the other hand, the effect of current over-run decreased the basic profits for lead covered cable by $488,000 and for supplies by $456,000.

1315 "Q. And in order that we can get the picture clear at this point, the Manufacturing Department surplus, which we discussed before—the adjustment resulted in an increase for all of the plants of basic gross profits by $1,162,000,

divided between telephone apparatus, $481,000, lead covered cable, $862,000, and a decrease in profits, basic gross profits for supplies, of $181,000, is that correct?

"I am now looking at Manufacturing Department surplus, that we have discussed before, and I want to get the significance of those adjustments.

"A. Well, the adjustment to which you refer is the adjustment of the total bulletin effect surplus applicable to sales.

"Q. That is right.

"A. Total sales, yes."

The next series of adjustments is known as "Inventory revaluations and reserves" and totals $6,625,000 in the
1316 red. The effect of these adjustments is that the basic gross profits have been decreased by $6,625,000, in the aggregate, except, of course, that the figure includes that moving reserve, which is in and out. The adjustment of $6,625,000 for the entire business is composed of an adjustment to decrease the basic gross profits on telephone apparatus by $5,945,000, on lead covered cable by $627,000, and on supplies by $53,000.

"Effect of eliminating overtime (except normal) and minimum earnings allowances" represents that part included in our standard cost of merchandise which was on the inventory covering overtime, except the normal overtime, and also represents that part included in our standard costs covering the difference between the minimum earnings that we guarantee
our employees and their piece rate earnings included in
1317 our standard costs, and those are all in the red for each of the classifications, and are in varying amounts for the plants, and for the merchandising departments. The total of this sub-division is $403,000, in the red (that is, a decrease in basic gross profits), and is made up of $401,000 for telephone apparatus and $2,000 for lead covered cable.

The adjustment for "Effect of eliminating productive labor increment loading except overtime and minimum earnings allowances" totals $724,000 in the red, divided between telephone apparatus $717,000, lead covered cable, $6,000, and $1,000 for supplies. In our standard cost is included an item

called increment labor. Increment labor includes the amounts paid to our employees while not working because of enforced absences for military and jury duty, vacations, pension accruals, sickness, and so forth. Now, this adjustment is to take out of our inventory that portion of those items which was spent during the year applicable to the inventory. The amounts vary between the plants and vary between the merchandising departments, and the instrument shops, and
1318 are divided between telephone apparatus and lead covered cable as stated.

The adjustment "Effect of eliminating factors in standard shop cost to recover: manufacturing development, including cost reduction; vacations; enforced absences, benefit payments; accrued service pension liability; general moves; rearrangements and reconstructions; expense of process storerooms not incurred; indeterminate losses" explains itself. The adjustments vary as between plants and between merchandising departments and are all decreases of basic gross profits.

1319 The adjustments for "Inventory revaluation and reserves" are divided between Bell and non-Bell business, in general, on the basis of standard shop costs to sales. There is a direct allocation between telephone apparatus, lead covered cable, and supplies.

"Q. But the allocation between Bell and non-Bell, and between specialty products—the appliances and the specialty products is on the basis of the aggregate shop costs of each class of item?

"A. That is right."

The next adjustment is for "Effect of eliminating factors in shrinkage for loss on reduction to fair market value and errors in figuring" and the total adjustment for this item results in a decrease in the basic gross profits of
1320 $326,000, made up of a decrease of $318,000 for telephone apparatus and of $8,000 for lead covered cable. This adjustment is self-explanatory. There is a factor in the standard cost to cover it, and when we come to inventory, we feel that we should not include in it any item put in the standard

cost to cover errors. We include it in the standard cost and then take it out as to the inventory valuation.

The next adjustment is for "Effect of eliminating preliminary packing, reel and spool expense, and cable stub details". The total effect of this adjustment is a decrease in the basic gross profits of $104,000 ($73,000 for telephone apparatus and $31,000 for lead covered cable).

The next is "Effect of eliminating loadings on commercial piece parts". The total adjustment here is a decrease in the basic gross profits of $26,000, all attributable to telephone apparatus.

1321 There are other adjustments for the following: "Effect of reduction of raw material from actual cost to market prices where lower"; "Reduction of non-bulletin items to bulletin cost levels"; "Reduction of local shop costs to Hawthorne cost level"; and "Effect of reduction to fair market value". In each of these cases, except one, there are decreases in the basic gross profits for telephone apparatus, supplies, and lead covered cable. The amounts of the adjustments vary between the manufacturing departments of Hawthorne, Kearny, and Point Breeze, and also vary between the merchandising departments. The allocation of these adjustments between telephone apparatus, lead covered cable, and supplies is made by direct allocation, but the apportionment between Bell and non-Bell, or between telephone appliances and specialty products, and between non-Bell appliances and Bell appliances is made generally on the basis of the aggregate shop costs of each class.

1322 The next adjustment is "Eliminating factors in 1930 bulletin for preparation expense at Point Breeze and Kearny not incurred in 1929". This results in a total decrease of $375,000 in the basic gross profits, divided $352,000 to telephone apparatus and $23,000 to lead covered cable. Obviously, as these expenses were not incurred, they should not be in the inventory.

The next adjustment is "Effect of reduction of excess shipments on open switchboard jobs to cost level". The result is a $22,000 decrease in basic gross profits.

The next is "Adjustment for redivision by merchandise classes of manufacturing operating surplus, inventory revaluations, and current under-run", the total effect of which was a $1,000 increase in the basic gross profits. This was made up of an adjustment of a $40,000 increase for telephone apparatus and a $39,000 decrease for lead covered cable.

The next is "Manufacturing department reserve for moving expenditures in 1930", which we have taken out for the purpose of inventory valuation. However, the moving reserve does not in any way affect the valuation of our inventory.

1323 These adjustments were also divided between telephone apparatus, lead covered cable, and supplies by direct allocation. In general, they were apportioned as between specialty products and telephone appliances as a class on the basis of aggregate shop cost of sales of each class, and as between telephone appliances sold to Bell and non-Bell customers on the basis of aggregate shop cost of sales of each class.

1324 Line 51, on page 2 of the report which we have just been discussing, shows the total basic gross profits for the year 1929, to which all of these other adjustments are made. The total basic gross profit in the Merchandise Department is $54,807,000; this is obtained by making certain adjustments to the figure of $56,899,000, with which we start. These adjustments are shown on page 1, the first one being "Reversal of 1928 claim entries". There are about ten miscellaneous small items of adjustment shown there.

1325 There is one adjustment here, entitled "Unexplained differences", amounting to $1,805,000, all allocated to telephone apparatus. In a big manufacturing organization, such as the Western Electric Company, we use certain

1326 tools during the year in order to ascertain the approximate results; and, at the end of the year, we get the actual figures from taking the actual inventory, and then explain the difference between the actual and the expected, so far as we can. We find finally that there are some items we cannot explain, and it so happens that, in this particular year, the difference we cannot explain amounts to $1,805,000. Of

course, in a big manufacturing plant there are losses from clerical errors, and so forth, that come in. This $1,805,000 is all allocated to telephone apparatus, because that is where the intricate process of accounting occurs and is neces-
1327 sary. Lead covered cable is simpler and the accounting more readily obtained without any possibility of error. The adjustment was then allocated between sound pictures and telephone appliances on the basis of the aggregate shop costs to sales of each class and between Bell and non-Bell customers likewise on the basis of aggregate shop costs of sales of each class.

There is another item for the distributing houses, entitled "Other adjustments to profit (including unexplained
1328 difference)", totaling $634,000, $343,000 of which was allocated to telephone apparatus, $34,000 to lead covered cable, and $257,000 to supplies. This is another one of those items that we cannot explain, but that certainly crept in; it is inherent in any accounting system that errors of this sort would occur. This adjustment was allocated between telephone apparatus, lead covered cable, and supplies on the basis of the distributing houses' sales of stocked materials. Of course, on supplies there are no shop costs and there the cost would be the purchase cost of the supplies. Lead covered cable was allocated on the basis of shop cost of sales. The adjustment was apportioned between Bell and non-Bell on the basis I have already discussed. As between sound
1329 pictures and telephone appliances, and as between Bell and non-Bell, the adjustments were on the basis of aggregate cost of all sales of each class to each class of customer. Whenever I use "cost of sales", it is synonymous with standard shop cost of sales.

1330 Under "Broadway" is an adjustment "Effect of change in reserve to distribute equipment gross profits in proportion to billing of installation". The effect of this adjustment was to decrease the basic gross profits by $618,000. We attempt to equalize profits on the total billing of switchboard equipment to our telephone companies. Of course, we ship the material first and it carries the larger profit. After

the material is shipped, there is the installation to be done, which is at a relatively lower profit (practically cost plus 6 per cent). In order to apportion properly in each year the profits on the total billing (although the shipment has been made and the title passed on the apparatus), we make a reserve, so as to only put into that particular year the profits applicable by using the average percentage rate.

The documents marked for identification as Defendants' Exhibits D-46 and D-47 show the basis of valuation of inventory and method of arriving at merchandise inventories
1331 as shown in the stockholders' reports as of December 31, 1915 and as of December 31, 1930.

Exhibit D-47 shows that we had, on December 31, 1930, an inventory, figured at standard costs, of $114,000,000, and that when we got through with our adjustments, we ended with an inventory valuation, which we used for the purpose of determining profits, of $86,000,000, or net adjustments decreasing the value of the inventory by $28,000,000. The
1332 $114,862,000 with which we started represents our inventory at the standard cost level in the manufacturing and merchandise departments and at the price level to
1333 the customers in the distributing houses. We first made a reduction to get to the standard cost level at the distributing houses from the price level. That $114,000,000 is after that reduction. I have it in mind that we started from $116,000,000. That adjustment does not appear on the exhibit.

The approximate $116,000,000 was reduced by a million or two million dollars to bring the distributing houses' new material inventories down to the standard cost level at the factory, so we have a standard cost inventory valuation at the factory of $114,000,000.

Then the $114,000,000 is reduced by $4,551,000, to reduce raw materials and raw material content standard cost to actual cost. That means that the inventory at standard
1334 cost was $4,551,000 more than our actual cost. We then reduced our cost to market, if lower than cost, which decreased the value by another $1,720,000. This reduced the inventory of materials to cost or market, whichever was lower.

We then reduced that cost or market, whichever is lower, to fair market value. This involved another $5,000,000 reduction in the value. This represents the amount which, from our experience, we considered necessary to write off because of the factor of having stocks in excess of normal requirements. In our business we have rapid changes in design of manufacture. The designs are made by the Bell Telephone Laboratories and are placed in the shop; the decision as to whether they shall be put into manufacture is dependent upon whether the Bell System, as a whole, is to be the gainer by putting them into manufacture, rather than whether it means a loss to the Western Electric Company or not; so we have
a distinct hazard in being required to junk or scrap
1335 stocks of material, which, from a System standpoint,
will be of advantage, but which, from the Western Electric Company's standpoint, will be of distinct disadvantage. Bearing that in mind, we have set up certain standards or relations; for six months stock, we show no depreciation; beyond six months, we have varying rates, depending upon the length of time it would take us to dispose of that stock on the basis of its expected use or sale. In addition, this includes, also, stock that is obsolete, or of poor physical condition. This $5,000,000 is supposed to take care of this contingency. For stock on hand in excess of six months' requirements, we apply varying percentages of depreciation, depending how long over six months we expect to have had it.

We start to depreciate the inventory because a por-
1336 tion of that inventory will have to stay on hand beyond
January 1, or may be scrapped and never used. Of
1337 course, there is a factor for the fact that it is not going
to move very rapidly. The normal rapidity that we use in order to determine how much we should take is usually a rapidity of inventory for six months from January 1. Of course, under present conditions, we have to normalize to some extent; we have to say, for instance, that in 1931 we do not think the division we had for the first six months was perhaps what ought to be expected over a normal period of six months. That may be up or down. The reduction for

market value at the end of 1930 amounted to $5,000,000.

1338 We figured that any merchandise that was going to be on hand longer than six months was worth less to us from a balance sheet standpoint. The same thing was true with specialties. We considered what the expected demand would be on those by our customers, both Bell and non-Bell.

The principle of this is to get at the fair value of the merchandise. We do not want to overestimate; we do not want to show in our balance sheet a value for merchandise in excess of what it really is worth. We do not want to tell our stockholders that we have our merchandise at a higher value than it is worth.

1339 The turnover of our entire investment on telephone apparatus is about once a year. Of course, that includes plant and other items, and I would say that on the average six months is probably the amount of stock that we normally ought to have for telephone apparatus business.

This study was made item by item on the inventories. On that basis we made our adjustments reaching $5,000,000.

The next adjustment is a decrease of $10,651,000 in the value of the inventory as "Reduction to fair market value on returned materials and special stocks (charged to defefred receivables)". This is of a slightly different character.

1340 We receive returned goods from the telephone companies and credit them with these returned goods at the current selling price. When we inventory these items, however, we inventory them at what we think they are worth. This $10,000,000 represents the difference between the price allowed the telephone companies and what we think that inventory should be valued at (it is over one-half of the current price with which we credit the telephone companies and is charged to the receivable account). In other words, this $10,651,000 item has no effect whatsoever on the profits of the Western Electric Company, but it does have an effect upon the value of the inventory, because the title to the returned goods has been passed to the Western Electric Company. The adjustment is made at the end of the year to bring it down to what

the Western Electric Company considers as a cost basis,
1341 and during all of the year there is a similar adjustment
made on an approximate basis. It has no effect whatsoever on the cost of sales, other than the minor fluctuations from month to month on this returned material stock.

The cost of sales takes into account the inventories on hand at the beginning of the year and at the end of the year. To
the extent that our inventory is cut down, the cost of
1342 sales goes up, but our inventory basis, as a part of the
investment, represents the average investment, month by month, during the year.

We require the use of the closing inventory, not only for the purpose of determining what our average investment was, but in determining what our gross profits were. Our gross profits will decrease to the extent of the additional inventory revaluations deducted at the end of one year over those deducted at the end of the previous year. However, when we take at the end of 1930, $10,651,000 from our inventory for revaluation of Class C returned material from selling price
to fair market value we have not decreased our basic
1343 gross profits by that amount, since this valuation is
charged to another asset account (Receivable) and not against profit.

The same deduction has been made from our average investment during the period of twelve months as the average amount during the period. This adjustment does not have any effect, so far as the computation of average investment is concerned, and has no effect on the gross profits. This returned material from the telephone companies is credited them at selling prices. The telephone companies agree that when the material is reissued to them, they will pay exactly the same price which we paid. Of course, the title has passed and we do not think that this returned material should be valued from a merchandising standpoint at selling price, so we charge the difference between what we think it is worth and what we have allowed the telephone companies to a receivable item, and credit merchandise inventory for the identical amount the credit to the telephone company in our receivable account and

we have a debit to the telephone company in merchandise of a certain amount, and a debit in receivables of another
1344 amount, which exactly offset each other, so there is no profit or loss to the transaction.

We resell this material to the telephone company plus a 3½ per cent service charge for the handling of the merchandise, plus a 6 per cent return on the investment involved in the merchandise. There is no profit involved in depreciating the inventory at the end of the year by the $10,000,000 item. The only profit that we make on the returned material from the telephone companies is a 3½ per cent service charge (which is to cover the expense of handling and practically covers the cost) and the 6 per cent return on the investment while we have it in our possession.

It enters our inventory at one price, which is adjusted, at the end of the year, to a lower value, because it is our property and we do not think it ought to be valued as high as we have credited the telephone companies, but as long as the telephone companies guarantee to take it back at the
1345 price which we allow them, there is no profit or loss to the Western Electric Company. The amounts of this material coming to the Western Electric Company and the amounts repurchased by the telephone companies are approximately the same. It runs something like $30,000,000 of returns to the Western Electric Company and about $31,000,000 or $32,000,000 reissues to the telephone companies. The excess of returns should be a credit on sales, being the total returns less the replacements which would be the net reduction from the sales.

1346 In valuing these returns, we attempt to get them down to the figure which corresponds to the level or fair market value in the case of the inventory, that is, to cost or market, whichever is lower, less an item which takes into account the rapidity of the movement of the product, and value it on the same basis as the Western Electric Company.

The next item, "Excluding direct labor increment loadings", reduces the inventory for 1930 by $1,198,000.

In the other column on Defendants' Exhibit D-47 for December 31, 1915, we start with an inventory of $20,000,000. The adjustments aggregated $2,651,000, as compared to the adjustments on December 31, 1930 of $28,000,000. These adjustments in 1915 vary some as compared to 1930, and there are some adjustments appearing in one which do not appear in the other.

1347 In recent years, you would find most all of the items that appear in the December 31, 1930 column, but they would not necessarily all be decreases from figured cost of inventories. In some cases, we have added to our inventory, because our cost of merchandise would be in excess of the standard. In a great many years it was that way. That is, the variations run plus and minus over a period of years.

EDGAR S. BLOOM, called as a witness on behalf of
1349 the plaintiff, having been first duly sworn, testified as follows:

Direct Examination by Mr. Thompson.

March 16, 1932

My name is Edgar S. Bloom and I live in New York City. I am at this time President of the Western Electric
1350 Company and have been since August, 1926. I was graduated from the Engineering Department of the University of Pennsylvania in June, 1895, with the degree of Bachelor of Science. I received the degree of Mechanical Engineer after one year of post-graduate work.

Immediately following, in July, 1896, I became connected with the Metropolitan Telephone and Telegraph Company, which was the predecessor of the present New York Telephone Company. I was about one year in the Traffic Department of that company as Traffic Inspector and Traffic Engineer. I was then transferred to the Construction Department and became a Foreman and Supervisor of line and cable gangs. About six months later, I was made Construction Engineer of the New York Telephone Company, and remained in that

position until June, 1906. I then became Superintendent of Plant of the New York-New Jersey Company, in what was then the City of Brooklyn, which position I held for one year, when I became Superintendent of Plant of the division of the New York-New Jersey Company in the State of New Jersey, operating throughout northern New Jersey contiguous to New York. Following that, I went to the Pacific Coast
1351 as General Superintendent of the Pacific Telephone and Telegraph Company, operating throughout the Pacific Coast states, where I had charge of construction and engineering. I was there close to a year, and then came back to New York and became Superintendent of Plant of all of upstate New York, except New York City.

I then went with the American Telephone and Telegraph Company as an engineer in charge of general supervision of plant operations of the Bell System all over the United States. Following that, I went to St. Louis as Executive Vice President of the four companies operating throughout the Southwest, which, about that time, were put into what is now known as the Southwestern Bell System, operating throughout the states of Missouri, Kansas, Texas, Arkansas, and Oklahoma.

Following that, in the spring of 1914, I came to Chicago as Receiver of the Central Union Telephone Company, in which position I remained until the receivership came to an end. I then became President of the Central Union Telephone Company, and, successively, President of the Ohio Bell, Cleveland Telephone Company, Indiana Bell Telephone Company, and Executive Vice President of what is now the
1352 Illinois Bell Telephone Company. Following that, in the spring of 1922, I went back to New York as Vice President of the American Telephone and Telegraph Company, and, in August, 1926, I became President of the Western Electric Company, which position I still retain.

The sale of our manufactured products to the Bell associated companies in 1920 amounted to $80,000,000, from which figure it increased gradually; in 1921, it went up to $111,000,000; in 1922, $125,000,000; in 1923, $144,000,000; in 1924, $192,000,000. That was a period of general increase

in wage levels in this country and one of general prosperity. That prosperity and increase in wage rates brought in a new economic level of people who became possible telephone
1353 subscribers. In addition, there had been a dammed-up demand as a result of the war, so that the growth during that period is accounted for by those two factors.

From 1924 until 1927, the business, from our standpoint, was relatively steady. In 1924, the sales amounted to $192,000,000; in 1925, $181,000,000; in 1926, $192,000,000; and in 1927, $183,000,000. Beginning with the spring of 1928, we noticed a very perceptible tendency, getting stronger each month, which indicated that the demands upon us were getting to be greater than our capacity. By the summer of 1928, we had made studies looking ahead five years. We had gathered information from the associated Bell companies and the American Telephone and Telegraph Company and had carefully studied their views.

All of the indications were that we were in for a very important period of heavy demands upon us. In 1928, our business increased to $200,000,000, which was the largest business we had ever done up to that time. In 1929, it increased to $278,000,000, and in 1930 (while the slump was on us,
1354 it did not affect us until the middle of 1930), the sales were $273,000,000. In 1931, they had dropped to $171,000,000.

Now, of course, in the spring of 1928 our plants did not have the capacity to take care of this absolutely unforeseen and extraordinary growth. We were put to it in every possible way to establish temporary facilities. We introduced overtime work during the day; we put on night shifts; we rented outside quarters temporarily to meet the situation; and by the middle of 1929 we had rented outside space equal to 25 per cent of the floor area of our permanent plants. Our studies looking ahead five years clearly indicated that this demand was going to hold up. We had tested the forecasts of all of the financial and statistical experts, and we drew on all of the fund of information that was available upon which to base our predictions.

It is uneconomical to carry on manufacturing in rented quarters scattered all over, but we had to take quarters for manufacturing space where we could find them, but we immediately began to plan for permanent manufacturing
1355 plant additions within our own Works locations. Our Works at Hawthorne seemed to us to be about a completed proposition. We were drawing heavily on the labor supply in Chicago, or in the area contiguous to Hawthorne, out of Cicero.

We had, in 1925, started our plant at Kearny. That had been started because we felt that we could not depend on this Chicago labor supply for any greater number of people on an advantageous basis. Kearny was operating when this heavy demand came on us, and we planned for certain additions to that plant.

At the same time, we had had under consideration the question of going into the manufacture of rubber covered wire, which had always been made by other manufacturers. We could see some great economies in going into that manufacture, and also we thought we could materially improve the product by being in close touch with its manufacture.

When this rush came upon us, we decided to establish a third plant somewhere on the Atlantic Seaboard, which would provide for this rubber covered wire plant, and also for an additional plant to take care of this increase of business on a permanent basis. We finally decided on the location at Point Breeze, Baltimore, Maryland, which is on the
1356 Atlantic Seaboard. The seaboard was selected because of the fact that one of the principal items of product that we expected to manufacture there, was lead covered long distance cable, and we wanted to be at a seaboard location to get the advantage of lower freight rates in shipping such cable to Pacific Coast points.

Of course, we had a very large program under way. We were in this situation: we had undertaken to furnish the Bell System (and had been doing it for years) to the best of our ability with everything that they needed in the way of apparatus and cable. The Bell System was serving the

public, and they could not go back to a possible subscriber and say, "We cannot give you a telephone because the Western Electric Company has not the capacity to manufacture the equipment." We had to be ready at all times, as far as was humanly possible, to meet the big public demand for telephone service. We were planning to meet this (as far
1357 as we could see at that time) extraordinary growth; and after the most intelligent consideration it looked as if that higher level of demands on us was going to continue.

After the stock market break on October 29, 1929, I called our people together and said, "We had better go slow for a few weeks on our Point Breeze additions." We had planned a very important unit down there, an apparatus shop, which involved many millions, and a very large increase in our capacity for the manufacture of telephones and allied apparatus, and we entirely stopped that building. We had a building planned at Kearny and we stopped that, although the foundations were under way; we completed the foundations.

1358 After the break in June, 1930, our business began to slip very rapidly from then right on to the end of the year. While the business for the year ($273,000,000) was almost as large as 1929, that was due to the business that we had on the books, which was completed in the early part of 1930. Towards the end of the year, however, we fully realized that business was slipping, and slipping rapidly; and then we absolutely shut off all of these additions and cancelled entirely those we had already stopped. The business slipped progressively throughout the last half of 1930 and all through 1931.

Beginning with the spring of 1931, our employment problem became most serious. We had been compelled to lay off a great many people, and we adopted the policy of spreading the work to the utmost limit; that is, we would provide 75 per cent work for 100 per cent of the people, instead of 100 per cent work for 75 per cent of the people. On the first of August, we put everybody (all the executives and everyone else in the company) on a five-day week, and in some of the

departments in the factories it was necessary to go to
1359 a lower basis than that, some of them working only four days a week. And that is our present situation. Our demands are very much smaller; for 1931 the total was $171,000,000, or only about 60 per cent of the output in 1929. As to these buildings that we rented (this 25 per cent floor space), we have been gradually moving that as rapidly as we could into permanent buildings, that we had planned to permanently take care of this heavier growth.

At the inception of the telephone industry, about all that the National Bell Telephone Company acquired was Mr. Bell's inventions. There were no telephone switchboards, there were no telephone cables, there were no twisted pair wires, no hard drawn copper wire.

1361 Back in 1879, Mr. Vail conceived this plan for the development of the telephone business in America:

First, there should be a parent organization, and underneath it should be financially controlled local companies attending to the local communities. To avoid duplication of study and effort by all of the many local companies, the parent organization would do for all, those things which one organization could best do economically and efficiently.

Second, that there should be a system of long distance lines connecting all of these local companies and looking to the development of a universal service.

Third, a manufacturing organization closely associated with the telephone industry, which would be responsive to the needs and demands of the telephone industry, and the development of which could be controlled in the interests of the telephone industry as compared with the selfish interests of the manufacturer itself.

1362 Between 1879 and 1882, the Bell Companies, through their licensee manufacturers (there were six small licensee manufacturers throughout the country), had developed principally signalling devices and call bells. When the telephone was put on the market, a man would take a telephone in his residence, and put another in his office, or his stable, and have a private line connection. But the demand

soon arose for interconnection. There was a company known as the Western Electric Manufacturing Company, which had been principally engaged in making telegraph apparatus. The telegraph business, at that time, had been developed into a commercially successful business, and this Western Electric Manufacturing Company had developed switching devices in connection with the telegraph business and it had the best switchboard business in America. It seemed natural, at that time, to attempt to get control of this Western Electric Manufacturing Company, in order to combine the best switchboard manufacturing knowledge in the country with the knowl-
1363 edge that the telephone companies' manufacturing licensees had as to signal apparatus, call bells, and so forth. In 1882, this control was acquired; the name was changed to the Western Electric Company; and the relationship has been maintained ever since.

That relationship has been an important factor in the economic development of the telephone service in America. Mr. Vail and his associates thoroughly realized that any manufacturing company making apparatus and devices for the telephone industry, would, during the process of manufacturing, invent many devices and patent them. If the manufacturer were not controlled by the telephone industry, the industry would for years pay tribute to this outside manufacturer who had developed devices because of its contact with the telephone industry. Here was an infant industry, nothing was known and everything had to be developed; so it was essential that the manufacturing organization should be in close relationship with the technical organization of the Bell Companies, in order that it would be responsive in every sense of the word to their needs.

Twenty devices might be perfectly proper and efficient
1364 for use, but if you could concentrate on one of them and put that into manufacture, you would get increased volume and the resulting economies that come with that volume. You could only obtain that through this close relationship between the manufacturing organization, the operating telephone companies, the technical staff of what is today the Bell

Laboratories, and the general staff of the American Telephone and Telegraph Company. So, through all of these years, there has been this constant relationship between the manufacturing company, the Western Electric Company, and the telephone organization.'

"Judge Wilkerson: What was the reason for having a manufacturing business conducted by a separate corporation?

"A. Well, it was a separate corporation at the time, your Honor, and while utility regulation had not come into being,—as you will recall Mr. Vail was one of the pioneers in the utility regulation, and he always thought that some day all public utilities would be regulated—a manufacturing company is of a different type, for the same reason the American Telephone & Telegraph Company, while it was the overhead organization—

1365 "Judge Wilkerson: Well, it was to keep the non-utility part of the business as a separate entity, was it not?

"A. That is my guess.

"Judge Wilkerson: Yes.

"A. I would think that would be the natural thing.

"Judge Wilkerson: I think that would be obvious.

"The Witness: That would be one of the natural reasons, although I do not believe it had crystallized into that at the time."

Every new device that is put out comes out in this way: first, the general staff of the American Telephone and Telegraph Company, through its contact with the associated companies all over the United States, finds out whether there is a need for a device to accomplish some specific thing. They consider it, and if it looks like it is a desirable thing to do, they put it up to the Bell Telephone Laboratories. The Bell Laboratories, from a technical standpoint, develops that
1366 into a device, which, perhaps, is not yet a device that can be manufactured. That device is then submitted to the Western Electric Company and it views it from the standpoint of the possibility of economical manufacture of the apparatus involved. Finally, after it has gone through

these organizations, and their minds have met, we get the finished device, which is then a standard for the Bell System for accomplishing the particular purpose involved.

A device is recommended as a standard device because it is felt that it is economically sound for use, not from the standpoint of the Western Electric Company as a manufacturer, but from the standpoint of the entire Bell System. Many devices are put into the System which mean a real loss to the Western Electric Company, but, because of longer life, lower maintenance charge, or for some other advantage, and after considering the Western Electric Company's loss and
1367 the benefits to the Bell System, in the end it proves to be economical and a sound thing to recommend to the System. Everything that is devised and finally comes into operation must pass this test: is it economically sound for the Bell System as a whole, including the Western Electric as the manufacturing end of the business?

The Western Electric has certain important advantages over other manufacturing companies. Two of the principal advantages are these: first, there is no credit risk in sales, as far as our Bell Telephone business is concerned, which is about 90 per cent of our business; second, there is no sales expense. The mere recommendation of the American Telephone and Telegraph Company, and the Laboratories, and ourselves, as a whole, after a device has been established, is all that is necessary. We do not have to go out and promote it. Now, those two things involve important savings, particularly in sales expense, and they have been passed on to the associated companies in the way of savings to them.

While they are advantages from the manufacturing end,
1368 they have meant nothing to us from a profit standpoint, because we have not retained that amount in the business. Aside from that, the risks of the Western Electric Company as a manufacturing company are about the same as any other manufacturing company. We have this advantage: we have a close contact with our customers; we have their estimates looking to the future, which enable us to plan a more steady load, but, unfortunately, their estimates are

not firm orders, and while they gave us estimates in 1928 and 1929, for example, as to what they would probably require, we, having assumed the obligation of taking care of them, found it necessary to provide the plant capacity so that we could take care of them. That demand, however, did not develop into orders, and we had no redress. That, in one sense of the word, is a disadvantage to the Western Electric Company as compared with other manufacturers.

In 1929, our sales of manufactured products were $278,000,000. From the best estimate we can make, we probably would have made more money in 1929 if we had refused
to take the last thirty or forty million dollars of busi-1369 ness. Our plants were working beyond capacity; we had all of these rented quarters; we had night work, which is always inefficient; overtime work, which is inefficient; our employees had been on overtime for some time, and were getting tired, and our efficiency was slipping down.

Furthermore, our manufacturing forces had increased terrifically. For instance, in 1925 we had 39,500 people on our payroll; in 1926, 45,000; in 1927, 40,000; in 1928, 56,000; and by the end of 1929 we had 84,000 people. That growth of employees began with the late spring of 1928. As I recall it, we had from 45,000 to 50,000 employees in the middle of 1928. We went up in one and a half years to 84,000 people; that is, we increased our forces practically 70 per cent in a little over one year. Now, those people, of course, were unskilled; they all had to be trained. That meant that it was necessary to take skilled men off their work to train these other people, and by the time we got up to the 84,000, the business began to slump. At the end of 1930 we were down to 64,000, and in 1931 we were down again to 44,000.

Now there was a terrific loss to us during the period
1370 of up-building and training the new forces, but there was nothing else we could do. We could not say "Well, it is not profitable to us to build this equipment for you, and we will not build it", because immediately the telephone companies would have been in trouble with their customers. The

customers would have appealed to the Public Service Commissions and the telephone companies would have been ordered to install the service.

While we have a great many advantages, those two I mentioned and this advantage of close contact with our customers; we have this important disadvantage: that we must be ready at all times to meet the peak demands of the telephone industry, and we cannot refuse to accept the business. That does not apply to other manufacturing companies. Outside of those differences, I see no difference in the risk of the Western Electric Company as compared with any other manufacturing company.

Not less than 10 per cent on the book cost would have been fair earnings for the Western Electric Company in its business with the Bell associated companies during the
1371 period 1916 to 1931. By "book cost", I mean the cost of the assets devoted to the Bell business less the current liabilities.

Cross-Examination by Mr. Goldstein.

The Western Electric Manufacturing Company, an Illinois corporation, was the predecessor of the present corporation, and, in turn, was the successor of several other companies; I have forgotten whether it was three or not. The American Bell Telephone Company, the predecessor of the American Telephone and Telegraph Company, obtained control of this merged corporation; I do not know the
1372 mechanism, but it did acquire control.

During the period 1881 to 1907, there was a very strong minority interest; General Steger and his successors ran the business. I would not say that the real transformation of the Western Electric Company into the Manufacturing Department of the Bell System commenced in 1907. The relationship became closer as time went on; it developed.
1373 Beginning with 1907, this relationship was accentuated. You could never have the same program when you have

a 49 per cent minority interest, as when you have practically 100 per cent control.

In 1907, when the American Telephone and Telegraph Company undertook to buy out the strong minority interest, it did not change the Engineering Department so as to work in with the American Company plant. It did work in more as the years went on, but that was a *natural* growth. I do not recall the date when the American Telephone and Telegraph Company acquired this strong minority interest; I do
1374 not recall whether it was 1907.

Prior to 1907, there were two engineering departments, one in the American Telephone and Telegraph Company and one in the Western Electric Company, and there still are two. I do not know whether they performed the same functions prior to 1907; I never had occasion to check that up. I know that they do not perform the same functions today.
1375 Undoubtedly, there was some duplication in the functions of the engineering departments of the American Telephone and Telegraph Company and the Western Electric Company prior to 1907. As the years have gone on, we have, with experience, been eliminating this duplication. There were duplications when I came into the Western Electric Company, and we have cut them out. I suppose there are some duplications today that we do not realize are duplications, but with experience we keep improving.

I do not know whether the American Telephone and Telegraph Company maintained laboratories apart from the Western Electric Company laboratories prior to 1907. They
1376 undoubtedly did, but I was in an associated company and I do not know. I do not know the exact date, but I know that we finally combined all of the laboratory work into what was then the Western Electric Engineering Department: I do not recall whether that was in 1907 or 1906, but it was around that time.

From 1907 to 1919, the Engineering Department of the Western Electric Company functioned to take care of all of the laboratory work and development and research that is largely done now in the Bell Laboratories. The Department

of Development and Research of the American Telephone and Telegraph Company was organized under that name
1377 in 1919; of course, it had been there before. I think there were some functions of the Western Electric Company that this department took over; it was a general rearrangement. In 1925, the Engineering Department of the Western Electric Company became the Bell Telephone Laboratories, owned jointly by the American Telephone and Telegraph Company and the Western Electric Company.

As I explained in my direct testimony, the Department of Development and Research, through its contacts with the associated companies, finds that there is a need for a
1378 certain device to accomplish a certain particular thing. They consider it from the standpoint of the telephone companies and recommend to the Laboratories that the device should be developed. For example, it may be that years ago there had been a great many complaints from people that they got a blow in the ear from capacity discharge. The Department of Development and Research would consider that and would take it up with the Laboratories, saying, "Here is a problem. We want to do away with this". The Laboratories would then go into it, work out a device or circuit, or whatever was necessary to cure that particular problem. The matter would then be taken up with the Western Electric Company, as to how to manufacture economically the device to accomplish the result desired.

The ideas as to what the telephone companies need, come from all of us. Any of us can suggest anything and the Department of Development and Research correlates it
1379 all by contact with the business.

Immediate contact with the telephone companies is through the Department of Operation and Engineering. The Department of Operation and Engineering, having found out what the telephone companies require, passes on the idea to the Department of Development and Research. But the
1380 Department of Development and Research itself, because of its general contact with the business, might see the need for something. So the ideas of the Department of

Development and Research might come from the Department of Operation and Engineering, from within that department itself, or from the Western Electric Company, or from anywhere in the business or from outside sources.

The Department of Development and Research does a certain amount of work before it passes on the idea to the Bell Telephone Laboratories, depending on the nature of the work and depending on the problem. It does the original
1381 research and fundamental study along certain lines that do not require laboratory research; they do not have complete laboratories.

The idea comes to the Department of Development and Research, which department considers it to the point where it can be developed as a practical device to accomplish the result desired. When it gets to that point, the Department of Development and Research releases it to the Bell
1382 Laboratories, which works on the design of an apparatus which will be practical to accomplish the particular thing. Then that is submitted to the Western Electric Company, to see if they can manufacture it efficiently or whether there has to be some change in the design to meet economical manufacturing.

In general, the Department of Development and Research performs the first step toward the development of new or improved products. But there are many lines of things that the Department of Development and Research does not enter into at all. The question of pole preservation, for instance, is handled by the engineers in the Laboratories. I do not know who first suggested the idea of pole preservation, but the Department of Development and Research did not make any study of that, as far as I know.

The Western Electric Company meets the require-
1383 ments after the Laboratories have met our ideas for economical manufacture and after we have met the Laboratories' ideas. It is a meeting of the minds. Then there is a final recommendation by the Department of Devel-

opment and Research that the device should be standard
1384 and it becomes a standard product and is brought to the attention of the associated companies through a bulletin saying that the device has been developed and we recommend it to accomplish certain results. That leads to sales by the Western Electric Company and is how we eliminate our sales resistance.

It is almost obvious that the associated companies pay their bills to us 100 per cent. We have the credit of the whole Bell System back of us. We have a customer where there is practically no credit risk. If, however, we were selling to thirty or forty thousand customers we would have some credit risk; 29,000 might be good credit risks, but the other 1,000 would be bad. We do not look at it as if it were
1385 the credit of the entire System. We do not look at it that way at all, but our experience has been that there is no credit risk. We are dealing with a very high grade of customers and we recognize that we have no credit risk. We do have a credit risk with our outside customers, the same as any other manufacturer.

This lack of credit risk is passed on to the Bell Telephone Companies because it does not appear in our expense. Any general manufacturing company would figure its distribution expense at anywhere from 15 to 25 per cent. Included in this distribution expense, is sales expense of approximately 5 per cent. The Western Electric Company incurs distribution expense other than sales expense. It does not incur sales expense. Manufacturing companies generally also incur credit risk of from 1 to 3 per cent. That would go in as an element of cost, but in the case of the Western Electric Company the sales expense and credit risk are not present and are not in our costs.

I was Receiver for the Central Union Telephone Company. That company was under receivership in Judge Dever's
1386 court from 1914 to 1919. The question as to whether we would purchase from the Western Electric Company came up the minute we became receivers. There was strenuous objection to our purchasing from the Western Electric

Company, and the court finally left it to the judgment of the Board of Receivers as to whom we should purchase from. We purchased every dollar from the Western Electric Company the same as we had in the past.

We went into the whole question and there was a very extensive investigation made. We found that it would cost the Central Union Telephone Company a great deal more money to buy on the open market and to establish its own purchasing department and to carry on the functions that were being carried on for us by the Western Electric Company. Therefore, the Board of Receivers decided to continue the relationship with the Western Electric Company, and it was continued throughout the entire receivership. The
1387 Western Electric had no credit risk at all, even though we were in receivership, because we paid our bills. The continuance of purchasing from the Western Electric Company was approved by the court.

The Western Electric Company did not appear in this matter, in any way, in court, but the American Telephone and Telegraph Company, as one of the parties in the suit, said, "You can do what you please," and the court left it to the Receivers. The Receivers of the Central Union got the money to pay the Western Electric Company bills from the
1388 receipts. The Central Union operated some three or four hundred thousand telephones. That was the only source of revenue we had. The Receivers did not borrow any money.

In the lawsuit there were several things challenged, and the money from the items challenged was impounded and held by the Central Union Telephone Company. The American Telephone and Telegraph Company consented that that money could be used by the Central Union Telephone Company for corporate uses approved by the Receivers, so we had plenty of money. Maybe "impounded" is not the proper legal term, but they consented to certain payments being deferred.
1389 Prior to the receivership, the Central Union Telephone Company was a good credit risk. It always paid its bills, but it did not pay any dividends. In order to pay its

bills, it borrowed large sums of money from the American Telephone and Telegraph Company. The source of money for its real operations was partly from earnings; as I recall it (I do not remember exactly now), the Central Union Telephone Company was earning enough money to pay all of its fixed charges in most years, but it had nothing left. Its indebtedness to the American Telephone and Telegraph Company was large, and constantly increased, because the business was growing and it needed money for capital expenditures. By capital expenditures, I mean the construction of new plant and that would be part of the money that would go to
1390 the Western Electric Company.

There is no legal assurance that the bills of the Western Electric Company to the licensee company will be paid because of their relationship with the American Telephone and Telegraph Company; but there is moral assurance, the same as with the Central Union Telephone Company. The American Telephone and Telegraph Company stood back of the Central Union in its dark days and performed a very valuable financial service to that company. It is really the background of the Bell System, of which the American Telephone and Telegraph Company is the controlling factor, to see that the licensees will not go astray or go into bankruptcy, and that they will meet their bills and obligations; that is also a thing that I took into account.

1391 I stated, for the reasons described, that in the early days the relationship with the Western Electric Company had been a good thing for the telephone companies. In the development of the Western Electric Company, there was undoubtedly a reciprocal advantage to it out of that relationship.

1392 The ideas as to the kind of items that should be developed came from all over. Let us assume that in America
1393 instead of the American Telephone and Telegraph Company, there had been just these 25 or 30 associated companies, each one separately owned and controlled. Let us further assume that the Western Electric Company was not controlled in any way by the Bell System, but was a separate

manufacturing organization. Under these assumptions, this is what would have happened:

Engineer A, out on the Pacific Coast, would have an idea which he would start to develop and spend a lot of money in experimentation. Engineer B, in another company, would have another idea, and likewise engineer C, and so on. There would be a great deal of duplication like in the railroad business when each master mechanic favors his own ideas. The Western Electric Company would have had the engineer 1394 from the Pacific Coast favoring a certain device and saying, "We want you to make that device for us." Engineer B in New York would have favored another device to accomplish exactly the same result. That would have meant that the Western Electric Company would have had to build two sets of machines, one to make the item for the Pacific company, and another to make the item for the New York company.

By virtue of this control and general supervision and close relationship, all that is eliminated. Each engineer in each company is not going off on his own hook developing his own ideas, but they are all under a general control. As I said before, the thing is done once and for all, and for all companies, in a most thorough way, because you have such a volume that you can afford to go into the greatest detail to develop the best possible idea. You could not do it in any other way.

The Western Electric Company has no competitors in sales to the Bell Companies because no one could compete with us in price. I know of no other reason why there is no competition. The associate companies are perfectly free, if they want, to buy from other sources, if they could find a 1395 better arrangement. Although there is this close relationship, there has never been compulsion. There has been only a compulsion of selfish interest, if I may express it that way.

I do not say that if the Western Electric Company were getting different ideas from all over the country we 1396 would not have quantity production and would not have

standardization. We still get ideas from all over the country.

I think unquestionably our competitors are hampered because they do not have the close relationship that we do; they cannot spend the money on the development of a
1397 particular idea because they have not the broad field that that we have.

The potential field for the products of our competitors outside of the Bell System I can best illustrate in this way:
1398 There are about 18,000,000 telephones in the Bell System and about 4,000,000 in the independent telephone development. There is a relative idea of the two fields. Even that does not give a clear picture, because the 18,000,000 Bell telephones, as a whole, are in the large cities and have a little more potential purchasing power than the 4,000,000 telephones in the smaller towns.

I should say that these 4,000,000 telephones are operated by about six or seven thousand companies. There are a lot of good sized companies. I do not now remember how many independent telephone companies operate in cities of 100,000.

1399 We purchase from Kellogg and Stromberg and from the Automatic Electric Company, certain items which are sold to the Bell System. These companies are, in a sense, competitors of ours, but not in the ordinary sense. I do not consider their prices are competitive with ours in the Bell business, because we make a different type of product.
1400 To expand on that answer, in the Bell System the primary consideration in everything that is put out is quality and operating cost as compared with low initial cost, and perhaps in service, high operating cost. That is because of this relationship in the Bell System. Quality is always the supreme condition in every device.

The Western Electric Company undertook some years ago to construct machine switching equipment for the telephone companies. I do not carry in mind the volume of that equipment manufactured by the Western Electric Company,

1401 but it has been rather large. It has been a substantial percentage of our product during the years.

I cannot state definitely when this machine switching program started in the Bell System, but it was somewhere 1402 in 1918, 1919 or 1920. I do not carry in mind what percentage of the Bell System is now on machine switching operation. It is less than 50 per cent. I imagine it is in the annual report of the American Company which has just been issued. The plans which we have made contemplate the completion of that program; that program was one of the reasons we have built our permanent investments. We have been looking 10 or 15 years ahead on that. I would say 1403 that if America is going to come back that there will be business from these concerns for 10 or 15 years.

In connection with that program, we undoubtedly had some development of patents to accomplish, although I am not familiar with the details; our development expense includes whatever that expense was. In addition, we have also acquired 1404 patents from others. I know that we acquired some patents from the Kellogg Switchboard Company somewhere around 1914, but I do not remember whether they were automatic patents or not. They may have been, but I do not know.

I do not happen to know whether we acquired any patents or licenses from the Stromberg Manufacturing Company. I would assume that we did. Our policy on patents has been to endeavor to acquire them whenever we felt that our failure to do so was going to hamper us in our field of development, even though we could not use the patent. We always wanted a free field of development along our own lines. In the case of a particular patent, we would say that it is of no special advantage to us, but we do acquire an interest in it, as it may be that our field will be narrowed; we cannot tell and we 1405 do not take chances.

We have given reciprocal licenses; that depends upon the deal. I do not recall any licenses to the Stromberg-Carlson Manufacturing Company in exchange for licenses to us in connection with machine switching.

"I do not know whether any of our licenses have provided that the licensee shall not sell any of the devices resulting from the use of the invention to the Bell System. We
1406 have made no general contract in restraint of trade.

"Q. All right. Concretely, what would you say, if you found that the Western Electric Company made an agreement with the Stromberg-Carlson Manufacturing Company somewhere around 1923, by the terms of which Stromberg gave the Western a license on the Stromberg patents relating to the panel-type and other types of machine-switching, and then you found that the Western Electric likewise gave Stromberg a license for its inventions—and then you found that it recited—a recital that there was a question as to whether Stromberg's inventions infringed on the Western's, and to eliminate that possibility, this contract was being entered into, and you found a restriction whereby Stromberg agreed that it would not make use of the license granted to it for the purpose of constructing any items of apparatus to sell to the Bell business—

"A. Oh, that is an entirely different problem.

"Mr. Thompson: Just a moment. Plaintiff objects to the question as argumentative, and beyond the proper field.
1407 "Judge Wilkerson: Do you know anything about it?

"A. I don't know anything about the particular contract, but I know, your Honor, that if we own a patent, we can in dealing with anyone, say whether we will give them a full patent on it, or a patent on it in one field, or in another field. That is perfectly legal. But that is entirely dif-
1408 ferent from what you were inferring.

"Q. There is no question of legality now, Mr. Bloom; I am trying to get the facts.

"A. Well, you cannot get it from me, because I do not know what you are talking about.

"Q. All right. If you do not know anything about it.

"A. No.

"Q. All right. Then you certainly did not take that into account in your statement as to what would be a fair return?

"A. That particular thing?

"Q. That fact—the fact that the Western Electric has eliminated competition on the machine-switching program or any part of it, in regard to—in its relation to the Bell System?

"A. No, no, we have not eliminated competition.

"Q. Well, will you please answer me. Did you or did you not take into account in your determination of a fair rate of return the fact that the Western Electric did, or might—did in fact eliminate such competition?

"Mr. Thompson: To which question the plaintiff objects.

1411 "The Witness: Well, the facts are these: I do not know the particular thing Mr. Goldstein is talking 1412 about—we own a patent; I do not know what it is—it may be a patent, as you say, on machine switching. Now we have a perfect right, as long as that is an adjudicated patent, to do what we please with it, and manufacture under it. We can give you a license in a limited field, or in no field. We can tell you that you can sell it to A and not to B, or not to C.

"You asked me whether I had taken account of this patent situation. No, I did not."

1413 I did not take the patent situation into account, because if I had, our profits would of necessity have been much larger, as under a patent you can exact anything you please, but that has not been the policy of the Bell System or the Western Electric Company.

I told in my direct examination about the increase in the volume of business beginning with 1928. That was also a period of activity in the outside business of the Western Electric, that is, in the business of the Electrical Research Products. In 1929 there was not so much as in 1928; the jump 1414 was in 1928. We did not have to do any reorganizing of the manufacturing business in connection with the Electrical Research Products as that was too small a percentage of the total. We had to establish a department to manufacture that apparatus. I do not know how many men we put

into that department or the size of the department.
1415 The great activity about that time that led to the increase in facilities was in Bell business.

No special plant or equipment whatever was built for the Electrical Research Products business. We put it into a small department out at Hawthorne. The room the department is in was a little longer and narrower than the court room. There may have been some machine investment to manufacture this equipment, but in relation to our volume and investment it was almost nothing. I might guess that
1416 the expenditure for this equipment was a couple of hundred thousand dollars or half a million, or a million.

This construction program for plant started in the fall of 1928. It was contemplated that it would continue for a period of three or four years, as I recall it. That is, it would run from 1928 to 1932, or 1933. At Point Breeze, we had it planned out for a period of about 15 years. In connection with the program, we contemplated spending somewhere around $100,000,000 altogether.

We had forecasts and information upon which we
1417 based our future program. Each year the associated telephone companies make up their budgets and their forecasts for the next year, and forecasts for the next five years. These budgets go to the Department of Operation and Engineering of the American Telephone and Telegraph Company, where they are assembled and considered, and bulked up. There are extensive conferences on them between the economists and the operating people of the American Telephone and Telegraph Company, as to whether in total that looks like a reasonable program in view of business conditions. They check up the general business conditions to get the best view that can be had for a general picture, and we are then advised as to that.

We find, for example (I am just taking that as a
1418 theoretical case and assuming that our manufactures have been running at the rate of $100,000,000 a year), in connection with this forecast, that at the beginning of the third year the requirements on us are going to jump

up to $200,000,000. That gives us a tip immediately, and we begin to figure just what we should do to meet this anticipated demand of two years later so that we are not caught at the last minute. We work up our ideas, and if we can, we wait until next year to see what jump is then contemplated for two or three years ahead. We wait until the last moment before we commit ourselves.

Nobody in 1927 had anticipated what was going to happen in 1929, and no one in 1929 anticipated what was going to happen at the end of the year. As a result, we came to this increase of business in 1928 and were forced to do a great deal of temporary work.

"Q. You say that nobody had anticipated the break. How long—this provisional estimate that you are talking about, the last one you used, at the end of that year, 1928, was that the one you based your program on?

1419 "A. Yes.

"Q. 1929?

"A. 1929.

"Q. 1927?

"A. 1927 and 1928, we reviewed them; they are in our proposed program, as forecast.

"Q. And which runs for about five years?

"A. Yes. Of course, the last few years are not on as solid a foundation, in fact, as the earlier years."

We check the likelihood of such a program in every way we can. The use of the economists of the organization is just one phase of the check. We had in mind at that time that there might be a break in prices or wages or wage levels between 1931 and 1940. We felt, back in 1927, that the building cost undoubtedly would come down, but we did not know when. I had in mind that wages might come down, but

1420 I hoped that we would never have to cut our wage level in the Western Electric Company, because I am a believer in high wages; I think they promote efficiency.

I felt that the wage levels other than those of the Western Electric Company might come down, and particularly those in the building trades, which I always thought were out of all

reason. The increase in wage levels of working people in general during the years of 1921, 1922, 1923 and 1924, was one of the elements causing the increase in business. There was also a greater demand, and, in turn, that reacts on business. In 1928 we took into account everything, including the possibilities of a decline in demand for telephone service because of a decline in wages outside the Western Electric Company.

1421 Provisional estimates made at the end of 1928 showed an increase in business during the period 1928 to 1932. I do not know whether it showed an increase for every year, but there was quite an increase, and it indicated that the level of business was higher and would be higher for the years 1931 to 1934. I did not see the provisional estimates,

1422 All I saw was the summary which estimated the telephone companies' stations and their plant requirements. This summary showed there would be an increase in stations each year from 1931 to 1934. I do not know who compiled the summary, but it was someone in the American Company. We had nothing to do with this compilation. We just got it after the American Company had it.

We did not accept the summary as facts, they are not facts, they are estimates. We accepted it as a fact that they did not give us wrong information, and we assumed that they had given us the information as they had it. There was no reason for their giving us wrong information. So far as rea-

1423 sonable, we relied on that information.

These summaries were made up of combinations from the various provisional estimates from the local companies. Provisional estimates are not a controlling part of our operations, but they are important information to us in order to enable us to start our studies. They are important in

1424 determining what they will require from us. It gives us a general idea.

These provisional estimates have not the same im-

1425 portant relationship to the Laboratories and the American Telephone and Telegraph Company as they have to us, at all. These figures can be converted into actual

estimates of probable volume of different types of equipment required of us. As far as the Laboratories and the general staff of the American Telephone and Telegraph Company are concerned, they have this problem before them planned out for years ahead; the mere fact that the growth is going to be 700,000 instead of 300,000 stations is not an important vital factor to the Laboratories.

It is important in this respect: some years ago, in forecasting the growth in New York City, for example, it
1426 was estimated that in about 15 years there would not be enough young women in New York City to operate the telephone switchboards. This was a tip to the general staff of the American Telephone and Telegraph Company and to the Bell Telephone Laboratories (then our Engineering Department). They started to work on the machine switching program. Those things are of importance to the Laboratories and to the Department of Development and Research for far views, but not for the immediate day to day or year to year use in the same respect as it is with us.

"Q. Now, Mr. Bloom, the Western Electric stands about 70 per cent of the entire expense of the Bell Telephone Laboratories, is that correct?

"A. Well, I do not know whether that is the exact percentage—

"Q. Well, about that.

"A. (Continuing): But it sounds about familiar.

"Q. 65 to 70 per cent.

"A. Depending—it is based on the use that we and the American Company make of the Laboratories."

1427 The program of the Bell Telephone Laboratories is according to a budget from year to year. I am a Director of the Bell Telephone Laboratories and am familiar with its operations.

1428 The 15 to 25 per cent sales expense and 1 to 3 per cent credit risk of which I spoke were intended to relate to the percentages of sales.

When I spoke about the forecast indicating increase in

stations, I meant an increasing increase each year. It gained a little momentum as it went along.

In general, a 10 per cent return on the book cost of property is a fair return for the Western Electric Company
1429 year in and year out. Of course, you cannot run a manufacturing business and make an even amount each year. In a period of unusual activity we make a little more. Other years we make a little less. But over a long period of years, a manufacturing company similar to the Western Electric, should make about 10 per cent on its assets devoted to that business, less current liabilities.

There is a relationship between our prices and a fair return on our property that we expect to get. Because of our close relationship, we have always attempted to keep our prices down to a figure which we consider beyond the criticism of any fair investigator.

I would consider the 10 per cent return on property
1430 a minimum to which we would be entitled. I said not less than 10 per cent. In 1923 we earned about 6 or 7 per cent (I forget the actual figure) on the basis I have defined.

I do not think there ever was a return on the Bell business, during the period 1923 to 1930, of 10 per cent on the book cost of the property less current liabilities. I think that such a return was earned on the non-Bell business during some of the years. We make all we can on the non-Bell business. There may have been one year when it was close to 10 per cent on the Bell business.

1431 The capital that goes into our business is determined by the total amount of our business. Inasmuch as some of the business is to outsiders, that proportion is determined by the outside business. I do not recall how much money went to the Western Electric Company from outside sources, other than earnings, during the period 1923 to 1930.

1433 I said that I consider that 10 per cent on the book cost of the property devoted to the Bell business less the current liabilities, would be a fair rate of earning for that class of business, considering the risks and everything that

was attached to it. That was not for any one year. It was an average for years.

1434 The amount of dollars necessary to pay interest, the amount of dollars to pay dividends, and the amount necessary to have left over to go to surplus, added together, must be the 10 per cent. You pay out your interest and dividends and what is left is surplus.

"Q. Then, your opinion that a 10 per cent return was the fair return over the period of years was on the 10 per cent on the amount of property represented by the bonds, and the stock and the surplus, is that it?

"A. I didn't say that at all.

1439 "Q. Assume that the book cost of that property is a hundred million dollars. Would you consider as adequate a return on the hundred million of dollars which was equal to 3 per cent, which took care of all of the expenses, took care of all of the interest, the amortization of the bonds, and yielded $9 per share for every $100 of investor's money in the capital stock?"

(Plaintiff objects to the question.)

1441 "Judge Wilkerson: He may answer subject to the objection, and you may make a motion to strike out the answer.

"A. The answer is that I would only consider it a fair earning if it was not less than 10 per cent on the book cost of the property. Now, here is the reason for it: the return on the stock, the dividends you pay on the stock means nothing until you investigate the whole corporate structure of the company. The company may have a tremendous

1442 amount of watered stock out, it may represent no value at all. I can well conceive that a 10 per cent earning might produce a half of 1 per cent on the stock, and still it would be a fair earning, in my judgment. Again, I can well conceive that the 10 per cent might result in a 200 per cent dividend on the stock, and not be an unfair earning. It would depend a great deal on the corporate structure, but—

"Q. I said $100 of investor's money, so it eliminates the possibility of watered stock.

"A. Oh, no, it doesn't at all. It cannot possibly eliminate it.

1443. "Mr. Goldstein: All right. The investor's money is his subscription to the stock, and that was $100 per share. Would you say, if it yielded $9 per $100 of investor's money represented by the amount of the investment in capital stock plus the surplus existing in the business, and belonging to the investor—

"A. Those figures mean nothing.

"Q. Those figures mean nothing?

"A. Those figures mean nothing unless you investigate the whole corporate structure. My answer is just the same as it was before, not less than 10 per cent on the book cost of the property devoted to the particular business."

That answer does not take into account the corporate structure of the company; it takes into account the book cost of the property and not the relation of the bonds, stock and surplus and all that sort of thing. It does not take into account the number of dollars represented by the bonds, stock and surplus, but it does take into account the book cost of the

1444 property which is on the asset and not the liability side. The depreciation reserve is on the liability side. I am talking about the assets of the company. Take the book cost of the property and deduct the current liability and you have the book assets devoted to this particular business. I have said all along that I took into account the liability, "current liabilities". But I did not take into account the particu-

1445 lar liability known as depreciation reserve.

I did not say that 10 per cent of all the assets was a "fair return". I said that it was "fair earnings". I said "fair earnings" because I wanted to distinguish between a return on a public utility and a manufacturing company. The fair earnings which I defined was 10 per cent on the book cost of the property less current liabilities. The 10 per cent I do not define as a return but as earnings.

1446 RICHARD H. GREGORY, a witness on behalf of the plaintiff, having been previously duly sworn, resumed the stand and testified further as follows:

Cross-Examination (continued) by Mr. Goldstein.

March 16, 1932.

We have apparatus and equipment designed wholly or in part by the Western Electric Company but manufactured by others. The sales of these items are included in Exhibits A-78 and A-79. Some parts of the apparatus included in Defendants' Exhibit 40-48 are manufactured by the Western Electric Company and shipped to the companies, and it is my impression that the article is shipped from these manufacturing companies in completed shape. I think the ship-
1447 ments are made direct from the outside manufacturer to the Bell licensee company. We consider them under manufactures and not under supplies, but it is my impression that they are sent direct from the outside manufacturers. There may be some cases where there is some work done.

The prices on these items are set by the General Commercial Manager at 195 Broadway. The independent manufacturer bills us and we bill at the price at which we sell. Whatever shipping instructions are necessary are made by us.
1450 I know that these items are included in the total sales to Bell Companies, where such apparatus was sold to the Bell Companies, and I assume it was practically all sold to Bell Companies. They are included in our cost of sales and in connection with our adjustments to the extent that the latter is applicable. The total costs of all our manufactures are included in our aggregate cost and as a basis of distribution of the adjustment between Bell and non-Bell business.

In determining the adjustment on the items manufactured by the Western Electric Company itself and what part of it should be allocated between Bell and non-Bell business,
1451 we take into account the total cost of our manufactures. I do not know whether that total cost includes or

excludes the cost of these items on Exhibit D-48; I would have to check up on that.

1453 I stated yesterday that I did not have the figures for 1929, but for the ten-year period the aggregate of the adjustments depending upon shop costs as a basis of allocation was 2 10 of 1 per cent. We have a statement showing the amount of that adjustment year by year, which, in
1454 the aggregate, equals 2 10 of 1 per cent. I will produce that statement for counsel for the defendants.

In the year 1916, we made adjustments from basic gross profits to arrive at the total gross profits. We then allocated these adjustments between non-Bell and Bell business, in order to arrive at the gross profit of the Bell business and the gross profit of the non-Bell business. All of the information concerning these adjustments allocated between Bell and non-Bell business, is in the underlying records, which the defendants have had access to since September, 1931. I am not able to say how much that adjustment was in 1916 which we apportioned between non-Bell and Bell business; I
1455 cannot carry all of those figures for 16 years in my mind. The data is in the underlying records and probably in some of these trunks in the courtroom.

There are six men from my organization in the courtroom now. All but one of them came from New York and they all came to help me in this case. I have the underlying data we used in determining the amount of the adjustments between Bell and non-Bell business in 1916 in this courtroom. I also have it for the years 1917, 1918, and every year thereafter.

1456 (It was agreed by counsel that representatives of each side would meet and attempt to agree what the basic gross profits and basic adjustments were for each year.)

1457 The prices for special commercial products sold to non-Bell customers were established by the General Commercial Manager on the same sort of basis as applied to the Bell business; all of the information went in, including competitive prices.

"Q. You have stated there were many kinds of adjustments, and the basic gross profits which have to be made in order to arrive at the annual gross profits, is that correct?

"A. We went over that yesterday, Mr. Goldstein.

"Q. Yes. Then, you said you arrive at the actual 1458 gross profit for the Bell and the non-Bell business separately, as shown in D-19, by computing just the aggregate basic gross profits of each class, and then applying a portion of the many kinds of adjustments to each class on the basis of the apportionment of their aggregate gross profits, or the aggregate standard costs?

"A. Shop costs.

"Q. Yes, that is correct. And in computing your ratios of the aggregate standard shop costs of Bell and non-Bell business, you included in each case the total of the appliances and the special commercial products sold to the Bell customers, and the appliances and special products sold to the non-Bell customers, as a unit?

"A. Took into consideration all of our shop costs.

"Q. Yes. Now, the result of that computation, you claim, gives you the correct statement of the actual gross profit resulting on the Bell and non-Bell business, and as shown in exhibit D-19.

"A. Yes, sir.

"Q. In order that your calculation should give that correct statement, do you not assume that the same ratio of adjustment is applicable each year to appliances as a class, 1459 and as to specialty products as a class?

"A. We spread that adjustment over the entire output of the factories that produce what we call telephone apparatus, which includes both specialty commercial products, as well as telephone apparatus.

"Q. But isn't that on the assumption that the same ratio of adjustment is applicable to one class as to the other?

"A. Yes, this 2/10 of 1 per cent over ten years would be applied equally over each class."

The same ratio of adjustment is applicable each year to appliances as a class and to specialty products as a class.

"Q. Have you any figures to prove that, to prove that the same ratio exists of adjustments of appliances as a class as it is to specialty products as a class for each year?"

In a large manufacturing business such as the West-
1460 ern Electric Company (manufacturing, as I said yesterday, over one hundred thousand different parts), when we get to the end of the year and find that there is this difference between the actual amount of labor, material and expenses and the amount included in the standard shop costs, the only practical way that we can apportion it is to prorate it over the entire output. I have data on which I based my statement that the same ratio of adjustment is applicable each year to appliances as a class and to specialty products as a class.

We divided our adjustment between telephone appliances sold to Bell and those sold to non-Bell customers on the basis that the total aggregate shop cost of sales to Bell and non-Bell business bore to the total aggregate shop cost of
1461 sales. We assume that the same ratio of adjustment is applicable each year to the appliances sold to the Bell and those sold to the non-Bell customers; we have no other way of doing it. We have no facts to prove that assumption, except experience in the business and sound business judgment and that it would be unwise and expensive to attempt to get any further details and to get a finer allocation of that deficit or surplus.

"Q. In other words, your conclusion that the same ratio of adjustment exists in the case of Bell and non-Bell sales is predicated upon the proposition that it would be too expensive to work up a method to find out?

"Mr. Thompson: The witness answers a question that an apportionment has been made on the basis of judgment and experience, and because it would be greatly expensive to do it another way. Then after he has answered it, then counsel said, 'Now, your answer is based upon the expense of doing this,' omitting two of the propositions that the witness has definitely placed in his former answer. I say that is
1462 not a proper way to cross-examine a witness.

"Mr. Goldstein: If counsel will permit his own statement to stand as the witness' answer, I am satisfied.

1463 "Mr. Thompson: All right. That is all right."

I spread the labor adjustment over Bell and non-Bell apparatus, including specialty products, on the basis of the shop costs of all of them. By so doing I assumed that the differences between the actual labor and what was used in the standard costs should be prorated in that way.

1464 Each item manufactured has a factor of labor, a factor of material, and a factor of overhead. Each item of non-Bell business has the same three factors. The allocation of this small variation (amounting to 2/10 of 1 per cent over the ten-year period) is on the basis of the total labor, material, and overhead in the standard costs compared with the actual expenditures for labor, material, and overhead with inventory adjustment computed at the end of the year. The adjustment is a combination of the adjustments of labor, material, and overhead.

1465 Of course, there are variations in the percentages of total cost of labor on different items of the one hundred thousand manufactured. They are infinite in number. In some items there may be a small percentage of labor, and in other items a large percentage of it. Of course, labor varies all over the lot.

"Q. Now, if an item which is sold to the Bell business—which is part of the Bell business, contains a ratio of 25 per cent labor, 25 per cent material and 50 per cent overhead—I am just using those figures for figures—and another item which is sold to non-Bell has a ratio of 50 per cent labor instead of 25, and 10 per cent material instead of 25, and 40 per cent of overhead, would an adjustment which takes care of the errors as to labor, material and overhead of both of those items, if spread on the basis of the actual shop cost, give you a correct adjustment?

"A. We, of course, never ascertained what the proportion is for specialty commercial products as compared with telephone apparatus. Undoubtedly there are variations. I don't know what they are, never attempted to find out what they

are. But your illustration is, of course, extreme. My
1466 impression is that the relation for both telephone apparatus and special commercial products, as far as the labor factor is concerned, is approximately the same."

"I should say that the relation for material in both telephone apparatus and special commercial products is approximately the same; of course, there are variations, and there may be wide variations, but, on the average, I should say they are the same. I would say the same as to overheads; I am not familiar with the details and I have not examined them, but that would be my impression.

I have never looked into the matter as to whether, on the average, the relation of the factor of labor to the total shop cost of appliances is the same as the ratio of labor to the factors making up the shop costs of specialty products.

The adjustments include also an adjustment of material.

1467 We average the entire matter on the total of the labor, the total of the material, and the total of the expense compared with the aggregate standard shop costs with inventory adjustments. The variation resulting amounts to 2 10 of 1 per cent, and is spread over all. There may be more or less material, more or less labor, or more or less expense that go to specialty commercial products; I do not know, and I have never looked into it. The variation of 2/10 of 1 per cent is the average I found for the period of ten years
1468 from 1921 to 1930. My answer would be the same in connection with the spreading of the overhead adjustment between non-Bell and Bell business.

"Q. Now, consider for the moment various customers within the Bell System; you assume, having spread the assessment over the Bell business as a unit, as compared to the non-Bell business, you have produced Exhibit A-78 as a result, which shows the profits of the Bell business as a whole, is that true?

"A. That is correct."

There have been produced in my direct evidence certain statements or exhibits which clearly indicate the relationship

between the profits on the particular items sold to the Illinois Bell and the profits on the sales to the Bell System as a whole.

That relation is shown on Exhibit A-93. Exhibit A-93
1469 shows the total sales to Bell customers at $3,100,000,000,
and sales to the Illinois Bell of $209,000,000, each covering the period 1916 to 1931, inclusive. This exhibit shows that the per cent net profit to sales on Bell business amounted to 4.9 per cent, and that the per cent net profit to sales on Illinois Bell business amounted to 5.3 per cent. It further shows that the per cent return on investment on Bell business as a whole amounted to 6.6 per cent, and the per cent return on investment on Illinois Bell business amounted to 7 per cent.

Plaintiff's Exhibit A-97 also indicates the return on investment in the Chicago area for the Illinois Bell business is 6.3 per cent, and the return on investment for the total Bell business for the same period (1928 to 1931) is exactly the same (6.3 per cent).

We arrived at the profits on the Illinois Bell business by taking the percentages shown on Exhibit A-88. In that exhibit is shown the percentages which total sales of telephone apparatus to all Bell companies bear to total sales to all
Bell companies. This percentage for the years 1916 to
1470 1930 is 52.9 per cent. I later put in evidence the figures
from 1916 to 1931, which show 53.7 per cent for telephone apparatus. The figures that I will now give are for the period 1916 to 1931: the per cent of total sales of telephone apparatus to the Illinois Bell was 59.1 per cent of total sales. Lead covered cable was 15 per cent of the total sales to all Bell companies and 15.1 per cent of the sales to the Illinois Bell. Supplies were 31.3 per cent of the sales to all Bell companies and 25.8 per cent of the sales to the Illinois Bell.

It is by the application of the average rate of net profit that we have made on each of these classes of business, telephone apparatus, lead covered cable and supplies with all Bell customers to the sales to the Illinois Bell Telephone Company, that gives the profit made on the Illinois Bell business as compared to the profit made on the Bell business as

a whole, and is shown in the exhibits which I read a moment ago.

As far as telephone apparatus is concerned, we first determined the per cent which the sale of telephone apparatus bore to total sales to all Bell companies. Then we ascertained
1471 the per cent which telephone apparatus bore to all sales to the Illinois Bell. As shown in the underlying exhibits, which the defendants have had access to, we know that we made a certain net profit on telephone apparatus during this period. This figure of profit, as I carry it in my mind, is 7.2 per cent, and, assuming for the purpose of this explanation that that is the correct percentage, we applied it (or whatever the correct percentage was) as a profit to the telephone apparatus sold the Illinois Bell Telephone Company. We did the same thing for cable and for supplies, and thereby got our total.

We divide the basic gross profits among the three
1472 main classifications; that is, telephone apparatus, supplies and cable. The adjustments which have been discussed heretofore are made on telephone apparatus, on cable, and on supplies separately. We assumed that because we made 7.2 per cent on all items of telephone apparatus sold to the Bell System as a whole that by applying 7.2 per cent to the sales of telephone apparatus to the Illinois Bell we get the net profit on our sales of telephone apparatus to the Illinois Bell, because we think that the sales to the Illinois Bell are a fair cross section of the total sales of the Western Electric Company on telephone apparatus. We made an actual division of the sales to the Illinois Bell Telephone Com-
1473 pany for the four years 1928 to 1931 between the sales in the Chicago area and those outside of the Chicago area, and applied whatever the rate of profit was for those particular years to the Chicago sales (this 7.2 per cent is the rate over the whole period of fifteen years). The rate which we applied to the particular sales of telephone apparatus, either to the Illinois Bell or to the Chicago division, was the rate representing the net profit on sales of telephone apparatus to all Bell customers for that year.

"Q. And that is on the assumption that the sales to the Illinois Bell or to the Chicago division, in either case, was a fair cross section of the operations of the Western Electric on telephone apparatus?

"A. Of course, when it comes to the Chicago area, we made an exact division there, and we know what the telephone apparatus portion is, but with that exception, Mr. Goldstein, your statement is correct."

It is on the basis of being a cross section. There are
1474 many items of apparatus. We know that the total cost of any article of telephone apparatus manufactured by us and sold to the Illinois Bell is the same for the Illinois Bell as if sold to any other customer.

The Illinois Bell buys telephone apparatus (a generic term which includes many items). Each of the items making up the one class of telephone apparatus has a varying ratio of
1475 labor, material and overhead. No one company purchases the same number of items as every other company, or the same proportion of the number of items as every other company in the Bell System. They change from time to time. We think that the Illinois Bell, on the average, gets just about the same number of items of the various kinds as the total relation of their purchases from the Western Electric Company bears to the purchases of all Bell companies.

There are about twenty thousand items, involving about one hundred thousand different parts, constituting the class known as telephone apparatus. There may be a very little variance in the ratio of labor, material and overhead in a great
1476 many of these items, and there may be more than a little variance. I do not know. I do not know the degree of variation. I do not know the degree of variation in a combination of these items purchased by the Illinois Bell and purchased by any other customer of the Bell System; this is averaged. I do not know that for any one month, or for any one year. We know the average adjustment that it is necessary to make at the end of the year. I do not know the average variation in the ratio of labor to total shop cost of the items sold to the Illinois Bell, and the ratio of labor to

the total shop cost of the items sold to the Bell System. I do not know the average of the ratio of material to total
1477 shop cost of the items sold to the Illinois Bell and the balance of the System. I do not know the average ratio of the overhead to the total shop costs of the aggregate of the items sold to the Illinois Bell and to the balance of the customers.

"Q. Without any knowledge of the ratio of labor, material and overhead to the total shop cost, and without specific knowledge—without knowledge of the amount of error in the labor, material and overhead constituting the standard shop cost of each item, how can you correctly adjust—spread the adjustments on the basis of the total shop costs and know that the adjustments later give you a correct result?

"A. By the use of common sense."

That common sense is based upon experience over the life of our business of manufacturing. It is based on the cost studies that we are making from time to time and our knowledge of the quantities of various materials and kinds of materials that are shipped to the various telephone companies.

The average adjustments will equalize over a period
1478 of years. I have already stated that over the ten-year period 1921 to 1930 the variation between standard and actual shop costs only amounted to 2/10 of 1 per cent. I could not tell whether it would require a ten-year period, or a nine-year period, or a seven-year period to equalize. I can tell what the facts are in the last ten years, but I cannot predict as to what they will be in the next ten years. I have no facts as to whether or not the adjustments on the merchandise purchased by the Illinois Bell in the years 1911 to 1920 will equalize the adjustments of purchases for any other period. The ten-year period of which I have spoken practically did
1479 equalize. I do not know whether if I had used a nine-year period it would have equalized, nor do I know whether a twelve-year period would have equalized.

In determining that the ten-year period would equalize, I took the actual facts. That is, I found, for example, that

in the year 1921 the adjustments increased the profits, while in the year 1922 they went the other way; I do not know about going up and down in any particular year, but over the ten-year period I know they did equalize, with a minor variation of 2/10 of 1 per cent.

1480 I do not know whether the net aggregate of the adjustments for labor alone would equalize over a period of ten years, nor do I know whether the net aggregate of adjustments for material would equalize over a period of ten years. The figures for overhead are available, but I do not carry them in mind.

This average of 2/10 of 1 per cent includes the combination of labor, material and overhead. The result of the
1481 adjustment of each of these could be ascertained. I took into account that the aggregate of all three would equalize. I do not know what the result would be separately. That is a matter of fact that I do not carry in mind. At the time that I arrived at the 2/10 of 1 per cent variation, I think I had the figures separately, but I did not attempt to keep those particular details in mind among the mass of figures I have to keep in mind. I knew, at the time that I came to the conclusion as to the 2/10 of 1 per cent for the aggregate of the adjustments, about the labor adjustment sepa-
1482 rately, but I do not recall what it was. I also had at the time the data showing whether the aggregate of the material adjustments taken separately would equalize over a period of years, and the same information concerning the adjustments of overhead separately. I will produce all that information for counsel for the defendants.

The adjustments in the Bell business were spread over
1483 the several main classes of products. The adjustments are spread over telephone apparatus as a whole and not by the items that make up the total of telephone apparatus. The result would be that the adjustments would be spread over the subclasses according to the percentage they bear of total standard shop costs of all with the aggregate of shop costs of each class. I think it would be very, very surprising if the ratio of labor, material and overhead to the total cost

were the same for each of the subclasses of telephone apparatus. It might be the same for lead covered cable, because lead covered cable is a simpler form of manufacture
1484 than is involved in the manufacture of one hundred thousand different parts; but I do not know. I should think that the ratio of labor to total shop costs for the various subclasses of telephone apparatus would vary. The same would be true with the ratio of material and overhead, because if the labor varies, the other two must vary. The combination of the various factors, then, would necessarily vary.'

"Q. Then with a variation in the ratios of labor, material and overhead, separately, and with a variation in the aggregate, how can you spread an adjustment over the various subclasses on the basis of the percentage of total shop cost and get a correct result?

"A. My answer to that is the same as I answered before. The result of our experience and study and knowledge of our business has convinced us that on the average, by applying it on the average, we get a correct result."

I selected the years 1921 to 1930 as a basis of my study
1485 because that was a period when we began to have a decline in prices for material purchased and was a period when we began particularly to make a reduction in prices to our customers. Beginning with 1921, the prices of our materials started to drop; 1921 was a year of depression. I do not recall whether prices were dropping in 1922. Previous to 1921, the years 1916, 1917 and 1918 were war years. Conditions were very unusual, and in 1919 and 1920 the price level went up. In 1921, prices went to a lower level, and I took that as more representative of an average than the whole fifteen-year period. I do not think that the period taken would affect the study. I would be perfectly willing to take the whole period of fifteen years. There is not much difference in the variation, whether you take fifteen years or you take
1486 only ten years. If I had taken five years, it would be different from the ten years and different from the fifteen years.

"Q. That is, the degree of error would depend upon the number of years that you took into your calculation?

"A. Well, the degree of adjustment.

"Q. Of adjustment?

"A. Not error. I would not call that error."

The degree of equalization, that is, whether it is 2/10 of 1 per cent, or 5 per cent, or 10 per cent, or 15 per cent, would depend upon the aggregate of the conditions in each of the years which make up the total. If you take fifteen years, you get one result; ten years, another; and five years, an-
1487 other. The ten-year period covers that period and nothing else. The ten-year period would not be intended to give a conclusion as to what was the situation before the ten-year period. The study is based upon the situation during the period 1921 to 1930 and covers only the question of the equalization of the adjustments during that period and nothing more.

1488 If we actually figured it out, we might find from a very careful study that the adjustments applicable to the Illinois Bell business would add a great deal larger amount to the cost and would reduce the per cent we are showing, but we do not think it is fair to do it that way. We might also find the converse. We have taken the average. We have averaged it by years; that is, each year in these results that are here are the adjustments for the particular year. The summation of all these adjustments over the period 1921 to 1930 I have given as 2/10 of 1 per cent.

I presume that we have varying adjustments within a single year between the items sold to the Illinois Bell and
1489 the items sold to other Bell customers. We have no knowledge as to whether the Illinois Bell would be affected adversely or advantageously during the year by our method of distributing these adjustments according to the percentage of the total apparatus purchased by it as compared to the whole.

In this exhibit, year by year, the item of the adjustment enters into the cost of sales as the adjustment for that particular year. Now for 1916, the adjustment would be for

1916, and so on. The result of the study which I have stated is for the aggregate of all the period 1921 to 1930. In one particular year, say 1923, the adjustment might affect the profits on the Illinois Bell business in one way and the balance of the Bell business in another way; but if the Illinois Bell purchases from the Western Electric a fair cross section of items which are manufactured for all companies for that particular year, it would not affect the result.

If the Illinois Bell purchases a fair cross section of the Western Electric manufactures for a particular year, the adjustments on the Illinois Bell business would not affect the results of that business in a dissimilar way than they would affect the results of the balance of the System. By a fair cross section, I mean that the Illinois Bell would purchase approximately the same percentage of each of the various items which the Bell System as a whole purchases from us. In other words, that they would purchase about the same percentage of total machine switching as the percentage of total Illinois Bell purchases are to the total Bell System purchases. To illustrate, if the Illinois Bell percentage of 1491 sales was 8 per cent of the total sales to the Bell System (that is an assumption), they would purchase about 8 per cent of the total sales of subsets made to the Bell System during that particular year.

"Q. Then it is your idea of a fair cross section in 1923 that if the Illinois Bell bought 8 per cent of the total number of dollars represented by the dollar sales of telephone apparatus, that that means that it bought 8 per cent of each of the 20,000 items that make up telephone apparatus, is that correct?

"A. I think that is correct, in the main. That is, we expect that if they have bought, say, fifteen millions of dollars in any one year, and our total sales are one hundred and fifty million of telephone apparatus, they bought ten per cent of the total.

"Now, we know that, by an actual study, we can find out

the quantities that have been sold or produced in that particular year, we can find out the quantities that are sold to the Illinois Bell. They will vary, of course; some will be above and below the 10 per cent, but the variation, I think,
would not be far from the 10 per cent, on the average."
1492 If the Illinois Bell in 1923 purchased a fair cross section of all of the items of telephone apparatus made by the Western Electric Company in that year, then the adjustments to the items purchased by the Illinois Bell would have the same effect as the adjustments on the items sold to the balance of the System. During the year 1923, the Western Electric Company manufactured several thousand items that come within the one classification of telephone apparatus. I assume that the fair cross section which the Illinois Bell
purchased in 1923 was a certain percentage of each of
1493 the twenty thousand items. We have, for each of the years, information, of course, as to the total sales of telephone apparatus to the Illinois Bell and also as to the total sales to the Bell companies. We also have information in some of the years for the quantities of items; I do not recall whether we had this information for 10 years.

At the time I made this study, I did not have the facts as to whether or not the Illinois Bell purchased in each of these 10 years the percentages of the particular items making up telephone apparatus, but it is perfectly common sense; knowledge of the business would enable anyone to say with assurance that the purchases of the Illinois Bell are a fair cross section of the purchases of the whole Bell System. They
might vary in different years; they might go up in one
1494 year and down in another year; I do not know. I think it is the cross section for a period of years that is determining.

"Q. Well, then, you are changing your answer, that it is not the cross section for the particular year that is involved, but over a period of years?

"A. Yes, and I think over a period of years it is determining."

I do not have any information for any particular year. My

testimony on this subject is directed to a period of years. I cannot draw any conclusion as to whether the adjustment in a particular year will have the same result on one customer's sales as it will on another's. The adjustment is so small it will make no difference. Common sense would indicate 1495 that it would be absolutely an unnecessary and very expensive process to attempt to get any further refinement of the facts of that allocation. The fact is we have not done it; we do not think it is necessary to do it.

The exhibits are predicated upon the proposition that over a period of years the Illinois Bell has purchased a fair cross section of the Western Electric manufactures. This 1496 study is for a 15 year period. We had some information which indicated that the Illinois Bell purchases were a fair cross section over a period of years. I did not have any facts showing what percentage of each of the one hundred thousand different parts manufactured by the Western Electric over the 15 year period was purchased by all of the Bell customers and what percentage was purchased by the Illinois Bell during the years. We did have facts showing what percentage of the total of certain subclasses that make up telephone apparatus was purchased by the Illinois Bell over the period of years. That information was obtained 1497 subsequent to the making up of these exhibits, and shows a fair cross section, in our judgment. We received figures showing that the Illinois Bell purchased over the period of years a certain percentage of each of the separate subclasses. I think, as I remember it, there may have been twenty-five or thirty main subclasses of telephone apparatus. The information was in quantities of items only and not in dollars. I do not recall the period that it covered.

We had prices during the year 1923 and made profits on the sales of items covered by those prices. To arrive at 1498 those profits, we made adjustments in that year to the basic gross profits, and then arrived at our gross profits. The prices are the same to all Bell customers. We average the adjustments to the basic gross profits over all the costs, but it is similarly affecting all of them. The adjustments

in a particular year may increase the profits and in an
1499 other year they may decrease the profits. In the 10
year period 1921 to 1930, the increases in the profits and
the decreases in the profits practically offset each other. In
manufacturing companies such as the Western Electric, I
think you have to take quite a period of years in order to get
a fair idea of what the results really are. No one year is
representative.

1500 We determine prices in the following manner: first,
we take the prices that are in effect at the time and
take into account the estimates of the volume of business we
expect to get from the telephone companies in the following
year. If, by that volume of business, we find that we are
going to get a return on the investment that is more than we
expect, then we have to reduce our prices.

If the net profits of the Western Electric Company for the
year 1923 were 25 per cent, I should think the prices were alto-
gether too high.

1501 In Exhibit A 78 is shown a net return on investment
of 10 per cent for 1925. That is the computation that
we made at the time as to the amount of money we
earned in relation to the investment as we have com-
1502 puted it in that particular year. If, for any particular
year, we made 10 per cent on investment, as we did in
1925, it would indicate that we were making a fair return on
the investment for that particular year. It might very well
be that we ought to have made considerably more than 10
per cent in that particular year, in order to take care of those
years in which we made less than 10 per cent. What we are
attempting to do is to get at least 10 per cent over an
1503 average period of time. We have used the same figure
of profit in the computation for the Illinois Bell. We
have assumed the same rate of profit applies to the Illinois
Bell as to the Bell System as a whole.

1504 "Q. How can the profits on the Illinois Bell business
as a whole in the year 1925 be representative of the
profits of the Illinois Bell purchases, if you don't know what

ratio of the items manufactured in 1925 for the entire Bell System was purchased by the Illinois Bell itself?

A. Well, we know, Mr. Goldstein, that every telephone company in the United States, associated company, buys proportionately about the same rates of the various items that the other companies do.

This ratio might vary by years, but over a period of years it is the same. I do not know about any particular year, 1505 but I think they all need the same kind of plant, central office equipment, subsets, lead covered cable, line wire, and poles. In proportion to the number of subscribers they have, they probably need just about the same percentage of each item.

I do not know whether each company in the Bell System had the same program for machine switching for each year. I have taken account of a period of years. I assumed in any particular year that the Bell System ratio was the ratio for the Illinois Bell, but whether it was or not, in the next year, if it wasn't, it would average out, so over a period of time we would get correct results.

MARCH 17, 1932.

1506 There was no change in the general price levels of
1507 the Western Electric Company in 1931. The rise in 1930 is due to the fact that the reductions we made July 1, 1929, when we anticipated a large increase in the volume of business, were too much. We found that, instead of getting an increase in business, business was falling off. We had followed the policy from 1921 (and in general) of making reductions in prices to Bell Companies and to all of our customers consistent with a fair earning on our investment. Even during those years when other manufacturing companies were increasing their prices or keeping them up, we were reducing our prices. Around July 1, 1929, we found that our prices would have been too high on the volume expected for 1930, but at the end of 1930 we saw that our

business was slipping away and in order to get fair earnings on the investment it was necessary to increase the prices.

The reduced prices in 1929 were in effect from July 1st
1508 of that year; in the early part of the year they were higher than the July 1 prices. We expected that our earnings would be more for the year 1929 than we actually got for the year. Conditions in 1929 were chaotic. We knew that we were going to get a big volume of business and so had to increase our forces to such an extent that our costs went up; that is, the level of efficiency went down. In the month of September alone we took on 7,500 employees in order to get 2,500 employees net. That was a very expensive process, and as a result of that inefficiency due to the rapid increase in our forces and even in spite of the volume of business we got, the net earnings on our business for the year were less than we expected.

The earnings on investment for the 1929 Bell business
1509 were 8.5 per cent, as shown on Exhibit A-78, and that was less than we had expected. I have quite clearly in mind that I made a study that indicated that if the orders continued at the rate they were at that time our fair earnings on the investment would have been 13 per cent or 14 per cent. Our volume did not decline in 1929, but the conditions of turning out that output in rented quarters scattered through various localities and with unskilled labor brought the earnings down.

1510 We first began to know that there was going to be an increase in volume in 1928, and I think we did some of the renting of these extra quarters in 1928. I have not in mind the figures showing the amount of the quarters rented
1512 after July, 1929, and those rented before that date. But I will furnish the figures to the counsel for the defendants.

I do not know the number of foremen we took off of their regular jobs to train new men before July 1st nor after July 1st. I have not those facts and I do not know whether they are available, although I presume they are.

1513 It was generally known throughout the Company at

the time that the decline in our earnings was due to the
1514 fact that we took men off from their jobs and had to train new men. I know from general information that it was hundreds of men that were so taken off their jobs, but that information was altogether general hearsay.

The non-Bell prices also went up in 1930; there was a general increase in the level of prices on our telephone apparatus sold to Bell and non-Bell customers, but no general increase in special commercial products. I do not know
1515 just how much special commercial products went up.

The prices in general, outside of those for goods sold to the Bell System, are governed in part by competitive conditions. In 1930, the prices went up to the non-Bell as well as to the Bell customers. I do not have in mind the figures in dollars of sales of special commercial products to non-Bell customers. We furnished to defendants a statement showing in dollars and by years what portion of special commercial products were sold jointly to Bell and non-Bell. I do not
1516 have that information by items. If there was any increase in price at all on an item which was sold jointly to Bell and non-Bell customers, it would apply to that item, whether sold to the Bell or non-Bell customers. Of course, I am testifying to the average price level and not to any particular item.

There is more than one item of special commercial
1517 products. I have no knowledge as to what the price change was, applicable to special commercial products sold to other than Bell customers. I do not know whether there was any such price change.

The actual 1931 figures for Exhibit A-80 are as follows: under the column Sales, $9,421,000; under the column
1518 Total Cost of Sales, $9,572,000; Net Profits, a red figure of $151,000; Percent Net Profits to Sales, a red figure of 1.6 per cent; Average Investment, $11,947,000; Percent Return on Investment, a red figure of 1.3.

Taking the figures that I gave for Exhibits A-78 and A-80, we made $10,500,000 on Bell business in 1931 and lost $151,000 on non-Bell business. The return on investment for the year

1931 on Bell business was 3.9 per cent, and on non-Bell was a red figure 1.3 per cent.

I have the total figures for the entire period 1916 to 1931, inclusive, for the non-Bell business, which are as follows:
1519 Sales, $695,714,000; Total Cost of Sales, $665,271,000; Net Profits, $30,443,000; Percent Net Profits to Sales, 4.4 per cent; Average Investment, $303,775,000; Percent Return on Investment, 10 per cent.

The net profits to sales for Bell business in 1930 was 3.4 per cent; in 1931 it was 4.8 per cent. On the non-Bell business it was 5.5 per cent in 1930 and 1.6 per cent in the red in 1931. We increased our ratio of net profits to sales on Bell business in 1931 over 1930 from 3.4 per cent to 4.8 per cent, but on our non-Bell business the ratio of net profits to sales declined
1520 from 5.5 per cent to minus 1.6 per cent. That is, the ratio of net profits to sales increased in Bell business and there was no net profit in 1931 for the non-Bell business.

When the International Western Electric Company was formed, it purchased part of its manufactures from the Western Electric Company in this country. Of course, whatever manufactures were made in this country carried a loading
1521 for development expenses in the price that was made to the foreign companies. That is the development expense made after the organization of the International Western Electric Company; we charge off development expense currently year by year.

There was an interchange of patent rights between the International Western Electric Company and the Western Electric Company. The International Western Electric Company had the right to file in foreign countries whatever of the Western Electric Company patents they thought were necessary. Of course, they only used that right to a limited extent. They paid nothing for that right and neither did we pay anything for the right to the patents resulting from inventions made by them in foreign countries. The International Western Electric Company had a Department of Development and

Research; they did development and research. I cannot
1522 tell you how large that department was as to numbers, but they expended quite a number of millions of dollars during this period in the development of apparatus which is adapted to foreign use. In foreign countries they have their own ideas as to what kind of apparatus they want. The International had the right to use all of the patents already owned by the Western Electric Company at the date of the organization of the International as we had the right to use their patents in this country. The International Western Electric Company was organized in 1918 and it paid nothing for the right to develop and use the patents theretofore developed and owned by the Western Electric Company.

1523 The Electrical Research Products Company had the right to use the patents of the Western Electric Company, owned by it at the date of the organization of the Electrical Research Products Company in its particular field, which was the sound picture field. The development expense after the organization of the Products Company was borne entirely by that company. As to all of the patents of the Western Electric Company in existence at the time of the organization of the Products Company, it had the right to make use of them in its field in so far as they were of any value to it. It has paid royalties to the American Telephone
1524 and Telegraph Company for that right. It has paid no royalties to the Western Electric Company, but as a result of the business with the Products Company there has been a large volume of manufactures placed in our factories and development expense has been spread on products delivered to that company in sound pictures as well as on Bell products. As the result of that (and without any specific development on sound pictures in the Western Electric Company) there has been something like $3,500,000 charged in the prices to the Products Company which otherwise would have been included in the cost of sales on Bell business.

1525 We suffered a loss in 1931 on the total non-Bell business. Except in so far as expenses of selling to distributors may vary from expenses of selling to the Bell customers,

there would be no variance in the net profit on items which are sold both to the Bell and the non-Bell customers. The loss on special commercial products is primarily due to the loss on sales of aviation equipment. We have had considerable commercial development expense in connection with that equipment and the volume of business has not been large enough for us to recover that expense and make a profit. We have lost money on the aviation business as there is a small market for that equipment. Only a few of the
1526 aviation lines have adopted this radio equipment, but, of course, as the aviation field develops that loss may be recouped in the future.

If there were in that year any commercial development expenses for items that have not yet been commercially materialized as commercial products, that would, of course, reflect as a cost in that year.

I think in general it is considered sound accounting practice to charge off development expense currently. I know that some companies have capitalized it to some extent but are very careful to mention that fact in the annual report and I know from a financial standpoint the bankers in loaning to them are questioning that practice very seriously.

I do not know what the practice of the 88 companies
1527 shown on Exhibit A-85 is with respect to development expense. I obtained all my information concerning these companies from Poor's and Moody's Manuals. I do not know whether there is any mention there as to how they have charged their development expense. I do not know whether Stewart-Warner does defer the charge but I would be very much surprised if there was a large percentage of the companies that did it. Some companies might charge the development expense for new and improved products to surplus.
1528 I should think that if we knew definitely that the development expense of a company on Exhibit A-85 is not included in cost and we knew what that development expense was, an adjustment should be made in the exhibit to make it comparable to the Western Electric Company where we charge all of the development expense currently into the cost

of sales. To the extent of whatever the adjustment amounts to, the company would not be on a comparable basis; the adjustment might be little or much.

1529 The Graybar Company does not exploit Western inventions. All it does is to distribute the products of the Western Electric Company; this constitutes about 14 or 15 per cent of Graybar's business. The rest of its business consists of buying from various manufacturers electrical supplies and selling them to consumers.

1530 (Statement showing Graybar Electric Company sales and estimated net profits on Western Electric manufactures 1926 to 1928 was marked for identification as Defendants' Exhibit D-49; statement showing Graybar Electric Company earnings for the years 1926, 1927 and 1928 marked for identification as Defendants' Exhibit D-50; statement of assets and liabilities of Graybar Company 1926 to 1928 marked for identification as Defendants' Exhibit D-51.)

These statements marked D-49, D-50 and D-51 are correct.

1531 The total sales of the Graybar Company for the year 1926 amounted to $76,588,000. Of this amount $12,172,000 was Western Electric manufactures. The net profit to Graybar on Western Electric manufactures was $1,204,000 and the total profit for the year was $1,348,000. In other words, the Graybar Company, paying the same or higher prices for our manufactures as the Bell Companies, was able to sell in competition with other manufacturers throughout the country and make $1,204,000 in that particular year. For the balance of $64,000,000 representing merchandise purchased from other manufacturers, the Graybar

1532 Company was able to sell to its customers in competition and make $144,000.

In 1927 the total sales of Graybar were $68,712,000, of which $9,020,000 was merchandise of Western Electric manufacture. The net profit on Western Electric manufac-

1533 tures was $993,000, while on non-Western Electric manufactures there was a profit of $771,000. This shows that on the non-Bell business of $59,000,000 in 1927 Graybar

made some $700,000, or five times as much as was made from the non-Western Electric manufactures in the previous year; that is, conditions were different in 1927 and they were able to make a good deal more money than they did the previous year on the purchase of supplies from others.

In 1928 Graybar sold $9,789,000 of Western Electric manufactures, on which the profit was $1,097,000; they sold about $63,000,000 worth of non-Western Electric manufactures, on which the profit was $1,450,000. The sales in dollars of
1534 non-Western Electric manufactures was about seven times as much as the sale of Western Electric manufactures.

I have my working papers showing the details of the assets and liabilities of the Western Electric Company which I used to arrive at the average investment shown on Exhibits A-77, A-78, A-79, and A-80. In arriving at average investment, we deducted the current liabilities, but did not deduct interest-bearing indebtedness of any kind, whether it was demand
1535 paper, three months paper, six months paper, twelve months paper, or two year paper. In some of the years we deducted and in some of the years we did not deduct the notes representing loans from the American Telephone and Telegraph Company to the Western Electric.

(Sheets given defendants by the Comptroller's department of the American Telephone and Telegraph
1536 Company representing loans to the Western Electric Company were marked for identification as Defendants' Exhibit D-52.)

The loans made by the American Telephone and Telegraph Company to the Western Electric Company in general were made on demand; sometimes they were outstanding for a considerable length of time, but it was the understanding that we could pay them off as necessary. These loans were notes payable in each case. I think they were by the terms
1537 of the instrument demand liabilities, although some of them may have been on the time basis. They were repaid as we had surplus cash beyond the particular needs of our business. In the earlier years, the interest rates were

the prevailing rates at which we could borrow money on the open market. In the earlier years, we were accustomed to borrow money from banks and when the American Telephone and Telegraph Company had surplus funds an arrangement was made with them whereby we would pay, on the average, about one-half of 1 per cent above the Federal Reserve Bank rate. In those earlier years, the American Telephone
1538 and Telegraph Company substituted as banker for our current loans. By "earlier years", I refer to the years prior to 1928 and 1929.

"Q. There are loans here I notice in 1922, 1923, 1924, 1925, 1926 and 1927. Those are the years you refer to?

"A. I think that is right.

"Q. Yes.

"A. (Continuing.) Although of course I have not examined that statement carefully.

"Q. Now, the rates indicated here show 3.5 and 4.5, with a high of 6 per cent in 1924 for several months, but excluding that, it is usually 4½ or 5 per cent; is that about the rate?

"A. That would be the rate that I would expect to see there, as a result of our practice at that time.

"Q. Yes.

"A. (Continuing.) Determining the rate of money."

Subsequent to 1927, there was a change in the arrange-
1539 ments between the Western Electric and the American Telephone and Telegraph Company. I do not remember the exact date, but about 1927 the American Telephone and Telegraph Company had, through a stock issue, a large amount of money on hand which they were temporarily investing in Government securities. At the same time we were engaged in a large plant extension program and there was an agreement at that time that the American Telephone and Telegraph Company would advance us sums as we would need them up to a maximum, I think, of $50,000,000 at a rate of interest which I think was 6 per cent. I don't remember
1540 just what year this was, but I think it was around 1928 or 1929. This statement shows that it was in 1929 the loans were made on that basis. These loans are included in

the payables which I have not deducted as current liabilities in determining average investment.

In October, 1930, the Teletype Corporation was purchased by the Western Electric Company. The mechanics of this purchase were as follows: the Teletype Corporation exchanged 150,000 shares of its stock for 150,000 shares of American Telephone and Telegraph Company stock. The Western Electric Company on the same day purchased the Teletype stock from the American Company for $30,000,000 and borrowed the money necessary to make that pur-
1541 chase from the American Telephone and Telegraph Company.

The Teletype Corporation sold 150,000 shares of its stock to the American Telephone and Telegraph Company in exchange for 150,000 shares of the stock of the American Telephone and Telegraph Company. The stock of the American Telephone and Telegraph Company was a hundred dollar par value stock but had a market value at that time of something like $215 per share. The Western Electric Company purchased the Teletype Corporation stock from the American Telephone and Telegraph Company and borrowed that $30,000,000 from the American Company. That $30,000,000 is the loan which is included in the payables.

1542 (The statement furnished to the defendants by the Western Electric Company showing the balance sheet of the Teletype Corporation as of September 30, 1930, was identified as Defendants' Exhibit D-53. A statement likewise furnished defendants by the Western Electric Company purporting to explain the purchase of the Teletype Corporation was identified as Defendants' Exhibit D-54.)

1543 The consolidated earnings statement of the Western Electric and subsidiaries includes the investment in the Teletype Corporation for 1930 and 1931. The investment included for that corporation is the $30,000,000 with whatever variations there may be from that figure; that is, subject to errors and additions or differences in plant valuation. The balance sheet of the Teletype Corporation as of September

30, 1930 (Exhibit D-53) is the balance sheet as of the date of the sale and is before giving effect to the purchase by the American Telephone and Telegraph Company.

1544 The balance sheet of the Teletype Corporation on October 1, 1930, is exactly the same as the balance sheet of September 30. There was a change in the balance sheet at December 31, 1930, to give effect to the investment of the Western Electric Company. I have a statement showing that.

1545 (Which said statement was marked for identification as Defendants' Exhibit D-55.)

This change in investment is reflected in the second line in the second column of Exhibit D-55, where there is shown in the balance sheet (as of December 31, 1930) an item of goodwill of $23,813,000. That accounts for the major portion of that change.

The Teletype Corporation prior to its sale to the American Telephone and Telegraph Company had a Department of Development and Research which employed, as I recollect it, 81 people out of a total of about 1,500 employees in the Corporation.

1546 "Q. And on January—the payroll for the Development and Research Department was $16,000 for the month of September, 1930, and your payroll for the entire organization of the Teletype was $246,000 a month.

"A. I think—that sounds right, Mr. Goldstein. I do not carry those figures in my mind.

"Q. And the same—the Development and Research Department of the Teletype Corporation has continued about the same since that time, has it not, as far as the employees and the functions are concerned?

"A. Well, I know that they have continued their development.

"Q. Yes.

"A. (Continuing.) To what extent there have been changes one way or the other, I am not informed.

"Q. They have maintained their Development and Research Department since?

"A. So far as I know.

"Q. And in 1931, November, which is the figure—the date of which we have the figures taken from some statements which you have made available to us, we find that there
1547 were 71 employees in the Development and Research Department, with a payroll of $15,000 per month, January, 1932, and there were about 822 employees for the Teletype Corporation, with a payroll of $116,000 per month.

"A. I think that is correct."

Other than the loans by the American Telephone and Telegraph Company which I have already described, there is included in payables, outstanding debentures of $35,000,000. There are also loans that have been made to us by the Trustee under the pension fund plan of approximately the same amount. These loans are made from the Trustee under the conditions I have previously described and all bear in-
1548 terest at the rate of 5½ per cent. The annual report to the stockholders shows the exact figures at the end of each year. We have not included these loans from the Trustee as a current liability. The loans are demand loans.

1549 The reason why it was decided in 1927 to deposit pension fund money with the bank, rather than to carry it on our accounts as before, was because about that time there was an Act of Congress which made pension accruals a proper deduction in determining income tax if the accruals were deposited with a trustee. We made this arrangement with the Trustee and paid the money to the Trustee and since that time have been able to deduct the current accruals and also the interest that we paid the Trustee in determining our net income for Federal tax purposes. Prior to 1928 we had an employees' benefit fund. In arriving at our average investment for the years 1916 to 1927, we did not make any deductions for reserve for pension funds.

1550 We also had working reserve which included such items as this moving reserve that I have described, and other reserves of an estimated nature representing the difference between what our books indicated would be shown for a particular period and what we felt from past experience

the results would actually be at the end of that year.
1551 In connection with these reserves, we set up the proper proportion of what we expected we would need for the year, and apportioned it to that particular month, and set it up in that particular month. The next month would be a varying amount, the next a similar amount, and so forth; it was the average of all of those. It would not be on a sinking fund basis.

The aggregate amounts of these working reserves included in our liabilities were as follows: 1931, $4,921,000; 1930,
1552 about $7,800,000; 1929, $9,800,000; 1928, $6,900,000; 1927, $11,100,000. I have only these figures back to 1927. $9,900,000 is approximately correct for the aggregate amount for 1926. There was no working reserve included for previous years.

In arriving at our average investment, we made no deduction whatever from the book cost of plant for depreciation.

1553 I think the option the Western Electric Company had on the stock of the International Telephone and Sales Corporation, of which I spoke, was in writing. I have never seen a copy of that option and I think it would; natu-
1554 rally, be surrendered on the sale. I have not a copy in my possession and to my knowledge the Western Electric Company has no copy. The option provided that the Western Electric Company, on the payment of approximately $800,000 (with certain adjustments for dividends), could acquire the capital stock of the International Telephone Sales and Engineering Corporation, which owned control of the Automatic Electric Company.

The Automatic Company made a series of contracts with Western, beginning in 1919, by which it was to manufacture for us certain step-by-step equipment which is sold by
1555 the Western to the Bell customers. There was a provision in the contract whereby advances could be made to the Automatic against shipments to be made in the future. What this meant was that the Automatic Company got its money for sales to us in advance of shipment, and paid us

interest for the period of time intervening between advance and the normal date of collection.

The Western Electric Company did not, to my knowledge, pay off a mortgage or bond issue of the Automatic as a part of the same transaction, nor did it advance any large
1556 sum of money to the Automatic. There have been payments made to the Automatic Company for licenses and patents; a complete list of these payments have been given to the defendants and are indicated on Defendants' Deposition Exhibits 189 and 190.

This option was given to the Western Electric Company in 1924. At that time the contract for the purchase of the Automatic manufactures by the Western Electric Company had expired and a new contract was in process of negotiation. The Western Electric Company felt that it should obtain the option (and the people who owned the stock were willing to give it) for the purpose of assurance that the quality
1557 and price of the apparatus delivered would be satisfactory to us.

There was a prior option given in 1919, running to the American Telephone and Telegraph Company. The American Company got an option when the first contract was made with the Automatic. At that time the Western Electric Company made this arrangement for the purchase of manu-
1558 factures from the Automatic for a period of five years.

The same reasons that influenced the acts of the Western Electric Company to secure its option influenced the American Telephone and Telegraph Company to secure an option; that is, to insure quality and price of products.

The American Telephone and Telegraph Company was not a party to the contract between the Western Electric Company and the Automatic Electric Company. I do not know how the option came to run to the American Telephone and Telegraph Company, nor the reason for it. The option to the American Company ran for five years, 1919 to 1924, and expired by its own terms.

1559 The contract made by the Western Electric Company with the Automatic Company in 1924 covered about the

same subject matter as the prior contract; that is, the purchase of products which were to be sold to Bell customers.

This time, however, the option ran to the Western Elec-
1560 tric Company. The period of this option was for five years and no money was passed for it. When the Electrical Research Products was formed in the latter part of 1926, this option was included among the non-Bell assets transferred to it. No value was placed on the books at the time of the option; its value was not known at that time.

I was not a party to the negotiation, but I know the facts concerning the circumstances under which the option was surrendered. In May, 1927, it was decided the Western Electric Company would not want to exercise the option. We were manufacturing step-by-step equipment in our own
1561 factories and in looking to the future, we saw we could very well take on the entire manufacture of automatic equipment at a later time, if we cared to do so. We entered negotiations with the former owners of the property and they were interested for a number of reasons. They were afraid, I think, that the option might pass to someone other than the Western Electric Company and they were anxious to acquire control of the company because at that time they were buying up independent telephone companies throughout the United States and expanding rapidly in Europe. This factory was the manufacturing department for such purchases.

At the same time they were interested in negotiating a contract with the Western Electric Company for a longer period and such contract was negotiated from the period 1927 through December 31, 1936. We had a five-year contract
1562 in 1924 which would run to 1929. We surrendered the option to them for $4,000,000 in 1927. We then made a new contract to continue the manufacture for the Western Electric Company for ten years from 1927; that is, expiring the last of 1936. As I remember it, the minimum volume to be purchased under the new contract (which is the one now in force) is something like $2,600,000 per annum, the previous contract was for $3,000,000 or $3,300,000 per annum.
1563 I did not say that our purpose in surrendering the

option was because we felt we would do all of the manufacturing ourselves. What I said was that we might be in a position later on to do so, if we wanted to. By later on, I mean subsequent to 1937.

The $4,000,000 received by Electrical Research Products for this option is not reflected in our Exhibits A-77 and A-78, which show the earnings on the Bell business. It is considered as a non-Bell asset. That is, as part of the earnings of the Products Company. Products Company earnings are not in

the non-Bell earnings in our exhibits, but are considered
1564 in the Electrical Research Products. They form part of

the earnings from which the Western Electric Company receives dividends, and part of the earnings from which the Western Electric Company received the $48,000,000 dividend in 1927.

The other sources from which this $48,000,000 dividend was derived were as follows: when the Products Company was formed in 1927, it was not only for the purpose of exploitation of the sound picture business and other specialty products, but it also took over some of the non-Bell assets of the Western Electric Company (consisting mostly of securities and a million dollars of cash) aggregating $41,000,000. That was the situation at the beginning of 1927.

During that year there was this receipt of $4,000,000
1565 from the Automatic Company on the sale of the option;

there was also a receipt from the final adjustment of the war claim at Antwerp (which was an asset of the Products Company) amounting to some $1,800,000. In that year we wrote up the book value of the Graybar and Northern Electric stock to more nearly represent our interest in the undistributed earnings and capital of those companies. There were also some royalties received during that year and a loss on the sound picture business of approximately $1,000,000. The net results of all these transactions meant that at the end of the year we had a capital of $1,000,000 in Electrical Research Products and a surplus of some $51,000,000. At that time it was decided that there should be a distribution of these assets which had been accumulating

over a long period of years on non-Bell business, and special dividends were declared, aggregating about $48,750,000.
1566 This dividend was paid to the Western Electric Company and it in turn paid it to its stockholders, without clearing through our surplus account.

On December 31, 1926, the Western Electric Company had in its possession about $21,000,000 of Liberty Bonds and about $9,000,000 of Treasury Notes, aggregating about $30,000,000. These thirty million dollars of Liberty Bonds and Treasury Notes formed a part of the payment of the dividend; in other words, the dividend was paid in part
1567 by these Notes and Liberty Bonds. We took whatever assets we had, whether cash or securities, to enable us to pay that dividend.

The thirty million dollars of Liberty Bonds and Notes were turned over to the Electrical Research Products on January 1, 1927. They were not needed as working capital of that company but were part of the non-Bell assets which the Electrical Research Products had been formed to take over.
1568 We turned over to the Products Company a large part of the non-Bell assets. We did not turn over to the Products Company those non-Bell assets included in the exhibits as non-Bell assets for 1926 nor for 1927, because they represented the portion of our manufacturing plant devoted to non-Bell business; we would not turn that over to the Products Company. We also had some cash receivables. The Liberty Bonds and Treasury Notes which we turned over to the Products Company were assets of the Western Electric Company not needed for operating purposes. These Notes and Liberty Bonds were in the treasury of the Western Electric Company for some period of time, maybe a year or so; I do not recall how long. The cash with which
1569 we purchased these Bonds and Notes came from whatever cash sources we had. In a large part, you have to go back for this cash to the sale of the International Western Electric Company, from which we received a large amount of money.

In 1925, when we apportioned the cash between Bell and

non-Bell, we apportioned some $24,000,000 of that cash as working capital for Bell business. As I recall it, in that year the large amount of cash we had on hand represented notes of telephone companies; I think the Pacific Telephone and
Telegraph Company and some other certificates. There
1570 were also certificates of deposit that we had in bank at
the time.

The International Telephone and Telegraph Company turned over to us $25,000,000 in bonds in 1925 under an agreement whereby we were to get, by October of that year, $23,500,000 in cash, as part of the purchase price of the International Western Electric Company. We did receive that cash in that year.

It is pretty hard to pin down the cash with which we purchased the Liberty Bonds and Treasury Notes to any particular time. So far as the apportionment of the investment
1571 is concerned, any securities which we have been dis-
cussing, that is, Liberty Bonds and Treasury Notes, would be included in Sundry Investments and not included in investment in operations.

"Q. Did you or did you not include the cash received from the International Western Electric Company as the cash which was apportioned between the Bell and non-Bell business in 1925?"

Whatever cash we had on hand in 1925 necessary to carry on the Bell and non-Bell business would be apportioned properly between the Bell and non-Bell business regardless of the sources of that cash. I think that we considered that all the cash we had on hand in that year was devoted either to Bell or non-Bell business.

We did not purchase those Liberty Bonds or securities with the cash received from the International Western Electric
Company sale the moment we received the cash. I think
1572 the proceeds of that sale were used to retire the pre-
ferred stock that was outstanding at that time.

The large amount of cash which we had in the year 1925 we got out of the general resources of the business.

When it comes to the apportionment of cash, the Western

Electric Company is in a peculiar position. It has been able to carry on its operation with a relatively small amount of cash for the reason that it has been able to get its money from the American Telephone and Telegraph Company on short notice. It has not been necessary to have large amounts of cash, such as the General Electric Company has (where they have $140,000,000 to $150,000,000 tied up). I think the
1573 amount of cash applicable to Bell business and non-Bell business over this fifteen-year period is an extremely low amount to carry on the immense business that we have had during that period although it may be particularly large in one year. In a particular year it might be a little high and in some years it might be a little low, but over the average, in my opinion, it is much lower than we would ordinarily expect a manufacturing corporation to have.

We received $29,000,000 in cash from the sale of the International Western Electric Company, which was used to retire outstanding preferred stock.

(Statement entitled "Analysis of average investment in operations, Bell business, years 1916 to 1930, inclusive," identified as Defendants' Exhibit D-56; statement showing "Average investment non-Bell business, years 1916 to 1930, inclusive," identified as Defendants' Exhibit D-57; statement showing "Analysis of Bell plant by classes of property for the years 1926 to 1930, inclusive," identified as Defendants' Exhibit D-58; statement showing "Analysis of non-Bell plant by classes of property for the years 1926 to 1930, inclusive," identified as Defendants' Exhibit D-59; statement showing "Average investment in Bell business divided between manufacturers and supplies, 1916 to 1930," identified as Defendants' Exhibit D-60.)

1575 The statements just identified are correct.

Exhibit D-56 shows $24,000,000 in cash as part of the Bell investment for the year 1925. It shows $8,000,000 for the previous year. That represents the difference in the cash we had on hand between the two years; the cash increased. The $8,000,000 might have been altogether too low

to carry on the manufacturing business of the Bell Companies in 1924, and I am not sure but that $24,000,000 might have been too low under the general conditions of 1925. Exhibit D-57 shows that $3,000,000 in cash was allocated to non-Bell business for 1925.

1577 "Q. In the year 1925, you show that the Bell business, in Exhibit A-77, was $226,000,000. In each year thereafter you show sales from $241,000,000 to $338,000,000 in Bell business. Your cash for the years subsequent to 1925 ranged from $4,000,000 to $9,000,000. Was there a shortage of cash in the subsequent years necessary for your business, for your Bell business?

"A. Mr. Goldstein, of course, this apportionment that we have made has been made year by year currently. That is, in 1917 we made the apportionment for 1916, and so on all the way through and these are the figures resulting from that apportionment made currently for the administrative purposes of the Company. Now, when we came to 1925, we had this large amount of cash on hand, and we apportioned it, certificates of deposit—"

The exhibit represents allocations which were made for administrative purposes.

1578 I think that the exhibit indicates the allocation of assets necessary, on the average, in the particular year for the sales to Bell customers. So far as cash is concerned, I would think that a percentage of less than 6 per cent of the total investment in cash would be a very modest amount to include during this period.

"Q. That is, your allocation in each year of assets is as you found them, without going into the question whether in the year 1925, for instance, $24,000,000 was really necessary for the Bell business?

"A. We made up this exhibit, as I stated before, from the records, that we made currently, year by year, long before we thought of any rate case at all, Mr. Goldstein.

"Q. Will you please answer?

"A. And they were used for administrative purposes, and, if you should go back now, in the light of present information,

you would make changes all the way through. Now, my estimate of what that change would be as a whole, would be that there would be practically no difference in the rate of
1579 return, even if we made all of the adjustments we might consider necessary."

If I went back now and revised the administrative reports, those revised reports would contain the same items as now appear in Exhibit A-77 for each of the years; there might be varying amounts up or down.

"Q. So that the figures in D-56 which show $24,000,000 in cash for the year 1925, as average investment in cash for the year 1925, is not intended to contain the number of dollars of cash which was necessary in the Bell business in that particular year, is that correct?"

As far as any particular year is concerned, there might be changes that could be made, but, as I said before, you have to consider these exhibits over a period of years for a manufacturing business. In any particular year you might want to change one figure and that might readily be less than is shown there. On the other hand, in the other years there might be considerably more cash that should be allo-
1580 cated to the Bell business than we have.

The exhibits showing the average investment in operations represent the amount that we considered as the proper amount in the particular year. That is, in 1926 we considered that a proper allocation against Bell business. If we were to go back now and allocate all of our assets, cash and receivables, merchandise and plant, and reallocate on our profits on the same basis, we would make considerable changes.
1581 In my opinion, I would say that $24,000,000 of cash was not necessary to manufacture the articles and to transact all of the necessary operations to make $226,000,000 of sales to the Bell customers in the year 1925. As is generally
1582 known, we do not finance a business in any one year for the needs of that particular year. We might, for instance, put out a bond issue of $35,000,000, as we did in 1924. Now, that was not for the needs of 1924, but was for the needs of succeeding years and in varying amounts. Now, in

that particular year it might be in excess, but for the average over the whole period of time, I consider the average cash devoted to Bell business is no more than a normal amount necessary to carry on that volume of business, and is less than most industrial concerns would consider as necessary. This apportionment has been made on the basis of the facts as we found them in a particular year, but the explanation I gave as to why cash was high in that particular year is because we do not finance every year. We have to finance for a period of years; we have a bond issue that runs for twenty years.

We issued $35,000,000 of debenture bonds on April 1,
1583 1924, and, as I recall it, got the money from that issue on the same day; I am not sure whether it was all paid on April 1st or was paid in part at later periods in the same year. I think it was all paid in the same year. The proceeds of this bond issue might be in cash or it might have been used to pay off interest-bearing indebtedness during that period.

1584 I cannot say from my own knowledge as to how the $24,000,000 happened to be piled up in 1925. I do know that there was a $35,000,000 bond issue in April 1, 1924, but I do not carry in mind just how the money was disbursed. I have in the court room the facts regarding the amount of cash and the amount of securities on hand on January 1, 1925. At that time we had marketable securities of $138,000 and cash of $9,920,000, or a total of something over $10,000,000. At the end of 1925, we had on hand $10,142,000 in marketable securities and $21,418,000 in cash.

1585 In 1925 we received $29,000,000 of cash from the sale of the International Western Electric. Not all of the cash received from this sale was used to retire our preferred stock. $24,679,000 of preferred stock was paid off; it was called at 110, which would take approximately $26,000,000 or $27,000,000. That would leave approximately $3,000,000 in cash from the sale of the International Western Electric.

We had, at the beginning of 1925, $138,000 in marketable

securities, and we had $10,000,000 in marketable securi-
1586 ties at the end of 1925. In the statement I have here the marketable securities at the end of 1926 are combined with investments. We had $31,000,000 in Liberty Bonds and Treasury Notes alone that we turned over to the Products Company, so we had investments in securities of $10,000,000 on December 31, 1925, and $30,000,000 in securities in December of 1926, which we turned over to the Products Company and which they returned to us as a dividend.

The source of the cash used to purchase the $30,000,000 of marketable securities between January 1, 1925, and December 31, 1925, is easily explained by a comparison of the balance sheet items of December 31, 1925, and December 31, 1926.
1587 At the end of 1925, we had $10,000,000 of marketable securities. At the end of 1926, we had $30,000,000 of Liberty Bonds and Treasury Notes, but when you look at the cash item, we had $21,418,000 at the end of 1925 and
1588 only $7,450,000 at the end of 1926.

It is absolutely impossible to apportion every dollar of cash received and say just where that cash went. Cash builds up just as it does in any business; it fluctuates from year to year from the normal transactions that we get. If the inventories go down, naturally the cash goes up; if the receivables go up, the cash goes down; if the payables go down, the cash probably is decreased; if the payables go up, you have got, perhaps, more cash on hand. You have to go through the whole process of the receiving and expenditure of cash, item by item.

"Q. Well, now, with those possibilities in view, will you please look at D-56 and D-57, which shows every item of assets, and state which you think, in your opinion, account for the moneys which were used to purchase these bonds?

"A. Well, now, on D-56, for instance, you look at the
1589 merchandise item, and you will find for 1924 an average of $70,914,000 of merchandise on hand. For 1925 there was an average of $57,127,000. Now, there is a decrease of $13,800,000. Now, whether it went in the plant, or where it went, I don't know, but certainly there are $13,000,000 which

came in because of the lower inventory values, inventories that we had at the end of that year."

The Graybar Corporation has, at all times, been considered as a non Bell asset, and it would not appear in this exhibit at all. I have been talking about Bell business and not non-Bell business. When we organized the Graybar Com-
1590 pany, we sold our supply department to it; that was in 1925. The Graybar Company took over the supply business in the United States, and took over the merchandise inventories in that business along with other assets.

The inventory turned over to the Graybar Company is reflected in Exhibit D 57. It shows that for 1925 there was $8,120,000 average inventory, whereas in 1926 it shows an inventory of $3,868,000. That reflects the sale of that merchandise to the Graybar Company and also any other fluctuations in the merchandise on non Bell business that might have occurred during the year. The total inventory that we turned over to the Graybar Company at the end of 1925 amounted to $4,490,000. The sale to Graybar constitutes a large part of the explanation of that shrinkage in the non-Bell inventory.

1591 As I said before, the merchandise for Bell business was reduced from $70,900,000 in 1924 to $57,127,000 in 1925. That would account for some part of that $24,000,000. It is a reduction of the general assets for the whole business, as a whole, which we have allocated in the method that we have stated which explains the cash on hand at the end of 1925. The non-Bell inventory, except for Graybar, shows no net shrinkage for this year. The shrinkage due to the sale to Graybar did not reflect itself in cash to the Western
1592 Electric in 1925.

The securities purchased at the end of 1925 were, of course, purchased from the surplus cash we had on hand coming from all sources. Whatever securities were purchased in 1925 were purchased from cash that came from the gen-
1593 eral cash resources of the Company during that year.

The difference between the $10,000,000 of marketable securities that we had on hand on December 31, 1925, and the

$30,000,000 of marketable securities on hand December 31, 1926, would come from cash that we had on hand on December 31, 1925, and from liquidation of any cash assets during the year, and from any other sources of cash that we might have had during that year.

The cash on hand at the end of 1925 certainly was a factor in the total cash which was apportioned between Bell and non Bell business. The total amount of cash we had on hand on December 31, 1925, was $21,418,000.

"Q. And that $21,000,000 entered into your average balances over the months which you totaled and apportioned in the manner in which you apportioned your cash between Bell and non Bell business?"

"A. Whatever the amounts were, of course.

1594 "Q. Yes.

"A. Varying amounts per month."

The dividend of $48,000,000, of which I have spoken before, represented the liquidation dividend of the non Bell profits that had been made over the life of the Western Electric Company and its predecessor, the Western Electric Company of Illinois. I know that the earnings on the non Bell business from 1881 on, on the foreign business and on the domestic business, aggregated an amount in excess of this $48,000,000.

1595 As to whether if we used $21,000,000 to purchase Liberty Bonds that would be necessary cash for the Bell business in 1925, my answer is the same as it has been before that the cash in any one year may be high or low over the period of years. When you find that over the entire period the cash only represents 5.9 per cent of the total investment, or 4.1 per cent of the sales, I think it is a very reasonable amount.

The allocation of the other assets, shown on D-56 and D-57, represents, of course, assets we have on hand. If we have merchandise on hand, it may be high in relation to our sales, but if we have it there, it is part of our investment. If we have our plant there, it is part of our investment. It may be high for the particular period. It is high now for our

1596 requirements, but we have paid out our money for it and it is part of our investment.

I have made a study, upon which I based my conclusion that the $48,000,000 dividend represents non Bell earnings. I have this study here, and it is entitled "Analysis of profits of business, other than with the Bell Telephone Companies, from 1881 to 1927, inclusive."

(Which said document was marked for identification as Defendants' Exhibit D 61.)

1597 The Western Electric Company declared a dividend of $48,750,000 to its stockholders.

The Electrical Research Products during the year 1927 increased its surplus around $10,000,000, as I recall it, of which $5,000,000 were earnings. Included in these earnings was the $4,000,000 on the sale of the option and the war claims which were valued in that particular year. They also included a loss on the talking motion picture equipment of $1,000,000.

1598 This dividend of $48,000,000 was really two dividends, one approximately of $3,500,000, which was considered the current dividend, and the other a special dividend of approximately $45,000,000. Some part of this $48,000,000 came from the current earnings of the Electrical Research Products, although, as will be seen from the statement that I presented to the defendants, the earnings on non-Bell business far exceed the total of $48,750,000.

As I have previously explained, the Liberty Bonds were used as a mechanism of paying the dividends. When the Western Electric Company received the bonds back from the Products Company, it used them as a medium for paying the dividend to the American Telephone and Telegraph Com-
1599 pany. At the time when it declared that dividend (December 31, 1927), it also transferred to surplus, the reserve for contingencies which was set up on its books, amounting to approximately $6,000,000. That reserve for contingencies stood in 1916 at approximately $4,000,000. The $2,500,000 difference in the reserve for contingencies during the period 1917 to 1927 represented the net increase in the reserve after the operating earnings had been determined: it had no
1600 part in these exhibits. This credit to reserve for contingencies is in effect a segregated surplus item: that is,

it is after the earnings have been determined. No deduction of that amount from gross revenue is made. First we obtain our earnings on the Bell and non-Bell business, which, we will say, is $15,000,000. Now, that $15,000,000 goes into these exhibits. When we get the $15,000,000, we set aside
1601 $2,000,000 of that in the reserve for contingencies, which is a segregated surplus. This reserve for contingencies was not deducted from the total of the gross assets less current payables upon which our return was calculated.

In 1930, certain assets were transferred to the Weco Corporation by the Electrical Research Products Company.
1602 When the Products Company was first formed, it was intended to take over the non-Bell assets and also exploit the talking motion picture business. As that business grew, however, we decided to confine the activities of the Products Company to the talking motion picture equipment business and to put into another corporation the securities which it held having no relation to the talking motion picture business.

(Document entitled "Weco Corporation opening balance sheet, May 31, 1930" identified as Defendants' Exhibit D-62; document headed "Weco Corporation" identified as Defendants' Exhibit D-63.)

"Q. If the Illinois Bell purchased in 1923 all of the plant items which it had in its plant account in that year, would such purchases also be considered by you as a fair cross section of the Western Electric manufactures for that year?

"A. I can't answer that.

1603 "Q. You don't know?

"A. No. But over a period of years, I feel quite confident that the Illinois Bell buys a fair cross section of all the manufactures of the Western Electric Company.

"Q. But not if it purchased all in one year, you don't know anything about that?

"A. No, I have never made that study."

If the entire plant of the Illinois Bell were divided between the various items that make up that plant, and were compared to a fair cross section of the aggregate of all of the plants

of all the telephone companies in the United States, I am not so sure but that you would find that it was a fair cross
1604 section. I have not made the study, but it seems to me it is a very reasonable conclusion to come to.

1605 "Q. Have you any opinion as to whether, if the purchases of the entire plant account of the Illinois Bell in 1923 were made on the basis of the prices for the year 1923, that the adjustments on the gross profits of those purchases would equalize in the same ratio as the adjustments on the purchases of the Bell System during that same year, as were in fact made?

"Mr. Thompson: I object to this question, because it
1606 contains a wholly impossible assumption.

"Mr. Goldstein: You have reproduced your property on those prices.

"Mr. Haight: I am willing to let it go on counsel's assertion that it is a perfectly impossible assumption.

"Mr. Thompson: All right. We are all agreed."

The apportionment of fixed plant was on the basis of use, as determined by the shop cost of sales; we used the shop cost of sales as a measure of use.

"Q. Now, the shop cost of sales is determined, as I understand it, by taking the opening inventory, by taking the production during the year, and then subtracting the closing inventory, and then from that you arrive at your cost of sales, is that correct?

1607 "A. That, in effect, is true."

The cost of sales takes into account three items: first, the opening inventory; second, the production; and third, the closing inventory. The opening inventory was not produced during the year in which the apportionment was made, but was produced in the previous year, or perhaps more than a year. We used the shop cost of sales for the purpose of this apportionment, excluding administration and things of that sort; that is, we are not using general and merchandising expenses for the purpose of apportioning plant.

Some of the items manufactured during a particular
1608 year are sold during that year, and some are not. The

carry-over of items manufactured in a particular year is not the same proportion of the production of that particular year; it varies. I have never made a study to find out whether the beginning and closing inventories are composed of the same ratio of the different kinds of piece parts manufactured during that year, but I think that just ordinary common knowledge would indicate that they would not be. The difference between the number of piece parts of each kind of item found in the opening inventory and found in the closing inventory is not in the same proportion each year; I made no study to test out any such thing. The beginning and closing in-
1609 ventories of Bell and non-Bell items, respectively, in any one year may or may not be composed of the same ratio of the different kinds of piece parts manufactured in that year. I do not know whether the difference between the number of piece parts of each kind of item manufactured by the Western in the opening and closing inventories of the Bell and non-Bell business is in the same proportion in any one year. From our experience, we think it irons out over a long period of time and if you apply the rule of reason, you get a correct result.

"Q. Yes. Now, have you any facts other than the rule of reason which led you to this conclusion which you just stated?"

"A. Experience."

I made no study on this subject and had no facts before me at any time to form that conclusion; I would consider it a very expensive process, without any practical result being ob-
tained.

1610 The ratio of dollar value of Bell to non-Bell in the opening inventory may or may not be the same as that ratio in the closing inventory in each year; I have never made any attempt to find out, and I do not know.

The jointly used plant, in general, is divided between Bell and non-Bell on the basis of the Company's standard shop cost of sales for that period.

"Q. Now, using seventy-five million as a shop cost of one, and twenty-five million as a shop cost of the other, you get a ratio of three to one?

"A. If that was the shop cost of sales in those years, it would be a three to one ratio.

"Q. How do you know that the production in that year for Bell and non-Bell business bore the same ratio as the shop cost of sales during that particular year in which these hundred millions of cost of sales were compared?

1611 "A. I never made a study to find out.

"Q. You don't know. Is it not a fact that in your apportionment of plant, you did not take into account the actual units manufactured during that year?

"A. The point we take into account is, as you have expressed it, Mr. Goldstein, we have taken the opening inventory and the production during the year, and the ending inventory, and apportioned it on that basis.

"Q. Now, in your conclusion there would be this apportionment of Bell and non-Bell on the basis of book cost,—on the basis of shop cost. You assume, do you not, that in each year the ratio of Bell to non-Bell shop cost of sales is the same as the ratio of Bell to non-Bell cost of production during that year?

"A. Now, I am making this division on the basis of shop cost of sales.

"Q. Yes.

"A. Now, I think it is perfectly clear to everybody in this court room just what I mean by that, and I cannot amplify that answer in any way whatsoever, Mr. Goldstein.

1612 "Q. All right. Now, in order to reach that conclusion, would it be necessary that the inventory at the beginning and the end of the year of Bell and non-Bell items were in the same ratio as the Bell and non-Bell cost of production during the year?

"A. You are going right back over the same ground again.

"Q. I am asking you, would it be necessary, or would it not, or you don't know? What is your answer?

"A. I have given you my answer. It is based on the shop cost of sales, and the method I have described in considerable detail, over two or three days, and that is the whole answer. I cannot amplify it any more than I have.

"Q. All right. Is the ratio of the cost of production of

Bell and non-Bell items each year the same as the ratio of cost of plant and equipment used to produce the Bell and non-Bell items during the year?

"Mr. Thompson: In the interest of time, your Honor, I object to this.

"Mr. Goldstein: This is an entirely different question.

"Judge Wilkerson: I think in the interest of time we will let the witness answer.

"Mr. Thompson: All right.

"Mr. Goldstein: Q. You have now the cost of plant, you have now the cost of plant, have you?

1613 "A. I will say that I don't know, I never made the study; I have never made that study.

"Q. You don't know whether the ratio of the cost—

"A. You are talking about items?

"Q. No, I am not talking about items at all. I am now talking about the ratio of the cost of production of Bell and non-Bell items each year.

"A. Yes.

"Q. And the ratio of the cost of the plant used to manufacture items during that year. Is there any relation between one and the other?

"A. Let me state the question as I think you have said it. I don't know as I get it. You are asking me now whether the cost of production of plant in one particular year—

"Q. Cost of production of merchandise.

"A. All right. Start that way, first. Start with the relation of the cost of production of merchandise in one particular year, in relation between Bell and non-Bell, to the cost of the production of plant in that particular year.

"Q. No, to the amount of plant used to produce those items during a particular year.

"A. The amount of plant used?"

1614 We are apportioning the amount of plant used to produce items in a given year according to the cost of sales of the items sold. As to whether there is any relation between the two, I think it is perfectly fair and correct to apportion the plant between Bell and non-Bell on the basis of

the usage of that plant which we have at that time. At the end of one year we may find that 90 per cent, based on the cost of sales, is applicable to Bell business; the next year may be 85, and in the next year it may be 95. It varies according to the cost of the sales in each and every year.

"Q. Will cost of sales of items which were manufactured in several years give you any measure of use of the plant to produce any items in a given year?

"A. I think that the cost of sales is a very good indicator of the use that the plant is put to."

Questioned by Court: I know of no other way that we could get at the use of a plant. If we cannot get at it
1615 in that way, the problem is unsolvable.

Questioned by Mr. Goldstein: I do not know whether the cost of equipment used in producing a dollar of Bell business is the same as the cost of plant used to produce a dollar of non-Bell business.

1616 In arriving at the average investment in inventory,
1617 we used the monthly balances, except in the consolidated returns, where we had to use the ending inventories for the subsidiary companies. When we used the monthly balances, we used the actual figures and made adjustments
1618 each month in so far as we knew them, and then made the final adjustments at the end of the year. I don't know whether the adjustments in December are larger or smaller than those in the other months.

My estimate of the portion of plant which was apportioned on the basis of the shop cost of sales each year would be that it was around 90 per cent; that would be the average, I would say. The portion of the total inventory allocated between Bell and non-Bell based on the basis of shop cost of sales appears in the Exhibits D-56 and D-57; it is purely a matter of computation. We do not apportion our entire inventory on the basis of shop cost of sales, for some part of it was directly al-
1619 locable either to Bell or non-Bell. I do not know whether our working papers show on their face the amount of inventory directly allocable and which it was not neces-
1620 sary to apportion. I do not know what portion of the cash

and current payables were divided on the basis of purchases of plant and what portion on cost of sales. I have not examined the working papers in such detail as would enable me to say whether this is shown in them. We make an apportionment of part of the cash and payables on the basis of purchases of plant. I believe the working papers upon
1621 which we made the apportionment are in the court room, but I do not know a detail of that sort, which is contained in 107 volumes, aggregating thousands and thousands of pages. I think I have in court all of the working papers that are reasonably necessary to substantiate this exhibit. I
1622 have here the consolidated balance sheet and earnings statement.

(Which said document was identified as Defendants' Exhibit D-64; and the explanatory sheet of which was identified as Defendants' Exhibit D-65; the sheet entitled "Net Profits on investment combined, as reported"
1623 was identified as Defendants' Exhibit D-66; the sheet entitled "Surplus adjustments made to combined earnings" was identified as Defendants' Exhibit D-67; the sheet entitled "Consolidated earnings of the Western Electric Company and subsidiaries, 1916 to 1930" was identified as Exhibit D-68.)

The consolidated income statement included that portion of the profit on the sale of the International Western Electric Company in excess of the undistributed earnings applicable to the period 1916 to 1931. There was an adjustment
1624 made for the Pension Fund to bring it down from the amount we set aside. There was no profit on account of the Graybar sale.

"Q. You did not include in your consolidated statement the $2,000,000 profit on the sale of the assets to the Bell Telephone Laboratories, did you?

"A. No, there was nothing in there. That was a surplus adjustment."

The consolidated statement shows that there are $3,000,000 earnings attributable to the sale of the option; I stated before that the sale was $4,000,000 and the explanation of that

$1,000,000 difference is this: in the agreement made in 1927,
when the sale was made, the agreed upon price was
1625 $4,000,000, but $1,000,000 was held in abeyance. If conditions which we thought would prevail in the following years did not prevail, that $1,000,000 would be paid back. The cash was paid in at the end of 1930, but the purchasers of the option are making a claim for that $1,000,000; they are claiming that back and the matter has not yet been settled. The basis of the claim is that the terms and conditions under which they were to pay the $4,000,000 in their mind were not met by the actual conditions that prevailed. There is a letter in existence describing the terms under which the option was sold; that letter is available.

1626 The Bell and non-Bell profits shown in my exhibits are from operating earnings only. The earnings statements of the various companies making up the 88 companies shown on Exhibit A-85 include operating and non-operating earnings, and the assets used as a basis in connection with the returns of these companies include operating assets and non-operating assets.

1627 "Mr. Goldstein: Q. In connection with your two exhibits, one return on investment and the other ratio of profits to sales of the eighty-eight companies, is there any relation between the ratio of net profits to sales of those companies, and the return on their investment?

"Mr. Thompson: As I understand the question, is there a ratio between them?

"Mr. Goldstein: Is there any relation?

1628 "Mr. Goldstein: If a company earns 10 per cent net profits on sales, will it earn 10 per cent on its investment?

"Judge Wilkerson: That depends on how much it has invested, of course.

"Mr. Goldstein: Correct. The exhibits are on the basis that there is some relation.

"Mr. Thompson: Why no; they have set out the facts.

"Judge Wilkerson: I don't understand there is any such relation claimed. They are independent showings.

"Mr. Thompson: Why, of course.

"Mr. Goldstein: With the statement of counsel that that is correct, why, we are satisfied."

1629 I stated that I excluded mining companies from the 88 companies. I have not checked over the 88 companies to see if there are mining companies among them. Maybe there are some of them that have mining operations, but they are so concealed that I never ran across them. I do not know whether the Allied Chemical, the Glidden property, the American Cyanide, the Goodyear, the International Harvester, or the Deering have mining operations; I haven't examined it in that detail. Of course, what we are trying to do here is to get representative companies. If they do mining, I presume that their mining operations are almost negligible. They would be put in if the mining operations were negligible.

I would consider a company comparable to the Western Electric Company for the purpose of this comparison
1630 that valued its inventory at cost; we value our inventory at cost, in general, I think, it is market or cost, whichever is lower. If you want to be absolutely meticulous you
1633 cannot make your comparison with any company. I do not know whether the Lorillard Company carries its inventory at cost.

1635 The development expense incurred by the Department of Development and Research of the American Telephone and Telegraph Company is all an expense of the American Telephone and Telegraph Company.

1636 (Statement of patents sold and licenses purchased from the American Telephone and Telegraph Company by the Western Electric Company marked for identification as Defendants' Exhibit D-69; statement showing a patent acquired by the Western Electric Company from the Stromberg-Carlson Telephone Manufacturing Company marked for identification as Defendants' Exhibit D-70; statement showing a patent acquired from the Kellogg Switchboard and Supply Company marked for identification as Defendants' Exhibit D-71. These

documents were furnished the defendants by the plaintiff, and it was agreed that they were authentic.)

We charged our entire development expense as a current expense. I do not know what the practice is of all other manufacturers.

1637 (Statement showing the description of Western Electric costs marked for identification as Defendants' Exhibit D-72; statement showing investment in Products Company of the Western Electric marked for identification as Defendants' Exhibit D-73; statement showing summary of results for years 1927 to 1930, inclusive, marked for identification as Defendants' Exhibit D-74; statement headed "Electrical Research Products, Inc., Analysis of principal items appearing on Products Company Report No. 1 for years 1927 to 1930, inclusive," was marked for identification as Defendants' Exhibit D-75; sheet headed "Controlling interest of American Telephone and Telegraph Company in Western Electric Company" was marked for identification as Defendants' Exhibit D-76; statement headed "Western Electric Company, Inc., Analysis of capital stock structure since commencement of business to December 31, 1930," was marked for identification as Defendants' Exhibit D-77; statement "1925 Cost of Sales" was marked for identification as Defendants' Exhibit D-78, and "1930 Cost of Sales" as Defendant's Exhibit D-79.)

CLARENCE G. STOLL, called as witness on behalf of
1642 the plaintiff, having been first duly sworn, testified as follows:

Direct Examination by Mr. Thompson.

March 21, 1932.

My name is Clarence G. Stoll. I live in New York City.

At this time I am Vice President in charge of opera-
1643 tions of the Western Electric Company, which position I have held since January 1, 1928.

After graduation from college, where I received a degree in electrical engineering, I entered the employ of the Western Electric Company at its Clinton Street factory in Chicago, in its College Students' Training Course. After about 4 months, I was transferred to the New York factory location, to complete my course there. About October, 1904, upon completion of my course, I was transferred to the Engineering Department of the Company, doing apparatus design work. Some time during 1906, I was placed in charge of apparatus design work. In March, 1907, I was transferred back to the Chicago Clinton Street location, in the Engineering Department, where I had charge of apparatus design and circuit work. In October, 1907, upon the consolidation of the Clinton Street Engineering Department with the New York Engineering Department, I was transferred back to New York, where I had charge of the consolidated apparatus and design work.

1644 About January 1, 1908, I was transferred to the manufacturing organization in the New York plant, at the time of the creation of the Engineer of Manufacturing Methods' organization. About 1911, I was given charge of the manufacturing branch of the New York shop. In October, 1912, I was transferred to one of the foreign subsidiaries, the Bell Telephone Manufacturing Company of Antwerp, Belgium, where I was in charge of the shop as Shop

Superintendent. Shortly after the outbreak of the war, activities at this location ceased, and after devoting some months to getting out of the factory and out of the war area certain materials, tools and special machinery for a particular class of product, and arranging for the shipment of those materials and tools to the Hawthorne Works of the Western Electric Company, I returned to America about May, 1915.

I entered the Hawthorne Works of the Western Electric Company as a representative of the foreign subsidiary in introducing the manufacture of those particular products into the Hawthorne Works, so that orders which the subsidiary company had prior to the war could be filled from this location. These orders were from England, Norway, Australia and New Zealand. About February, 1916, I was made Operating Superintendent of the Hawthorne Works,
1645 and in December of that same year I was made Technical Superintendent of the Hawthorne Works. In 1920, I think in August, I was made Assistant General Superintendent of the Hawthorne Works, in charge of operating, technical and inspection activities. Early in 1923, I was made Works Manager of the Hawthorne Works. In January, 1926, I was made General Manager of Manufacture, in charge of both the Hawthorne and Kearny Works. In July, 1926, I was made Vice President in charge of all manufacture for the Company, and held that position until I assumed my present position, on January 1, 1928. My entire business career of almost 30 years has been spent in the Operating Department of the Western Electric Company. I am familiar with the plants where the Western Electric Company manufactures its products, with its methods of manufacture, and with the other manufacturing operations.

1646 I am likewise President and Director of the Teletype Corporation, owned by the Western Electric Company. I am a Director of the Northern Electric Company, in which the Western Electric Company has an interest, but not control. I am a Director of the Bell Telephone Laboratories, which is jointly owned by the Western Electric Company and the American Telephone and Telegraph Company; and of the

Western Electric Company itself, and in several Western Electric Company subsidiaries.

The Western Electric Company is a manufacturer of telephone apparatus primarily for the Bell System. It also acts as purchasing agent for the Bell System of supplies manufactured by others. It installs, warehouses and distributes telephone apparatus and supplies for the operating Bell Companies and the Long Lines Department of the American Telephone and Telegraph Company.

1647 The activities of the Western Electric Company under my supervision as Vice President in charge of operations cover:

Manufacturing, which, as its name implies, has to do with all the manufacturing operations of the Company.

Installation: a nation-wide organization of men skilled in the erection of telephone central offices manufactured by our Company.

Sales, which handles the warehousing and distribution of our manufactured products and purchased supplies for the operating telephone companies.

Purchasing: the organization which buys the raw materials used in our manufactured products, and supplies manufactured by others which are resold to the operating companies.

Personnel, headed by a Personnel Director, who is responsible for determining the personnel policies throughout the Company, for planning a co-ordinated effort throughout all the departments of the Company in obtaining technically trained men from colleges and universities to enter the employ of the Company, and for the operation of our Benefit Department and pension plan.

Publicity, which handles all the Company's general relations with the public and all publicity, supervises our Company employee publications, and handles the little advertising we do.

Commercial, which handles our contractual relations, the supply contract with the operating telephone companies and our contracts with distributors, the purchase of products

under contract from other telephone manufacturers, the establishment of prices on our products and purchased supplies to all customers, and our relations with the Bell Telephone Laboratories in the authorization of development work, the ex-
pense of which is to be borne by the Western Electric
1648 Company.

There is a distinction between the development work of the American Telephone and Telegraph Company and that of the Western Electric Company. The American Telephone and Telegraph Company authorizes and pays for fundamental research and development work basic to the communication art. The Western Electric authorizes and pays for the application of the results of that research and development work
in the creation of specific new and improved devices
1649 for use in the communication field. The development work which is carried on in behalf of the Western Electric Company relates primarily to the form of the manufactured article.

The following is an example of the above distinction: the American Telephone and Telegraph Company conducted a research into all possible combinations of iron and nickel, to determine the electrical and physical properties of each combination, also under varying degrees of temperature. The result was the discovery of permalloy, which possessed remark-
able magnetic properties many times more magnetic than
1650 the irons and steels theretofore used in loading coils.

The work of the American Telephone and Telegraph Company ceased with the discovery of the alloy, its properties and its field of use. The Western Electric Company then took up the problem of substituting that alloy for the electro-magnetic iron powder used in the core of the loading coil, which resulted in the development of a loading coil about one-quarter the size of the old iron core loading coil and considerably more efficient. It permitted a much smaller winding of the copper upon the core in order to produce a coil. The smaller size coil permitted a considerably smaller containing pot, which, in turn, required less space in the street manholes of underground cable units.

The result of that single research and development over a 4-year period, from 1927 to 1930, saved the operating companies over $15,000,000.

1651 Development and research are necessary if the Bell System is to give its patrons the best telephone service that can be devised.

The practice of the Western Electric Company of charging development work to expense in the year in which it is incurred, is, in my opinion, fair and proper. The business of the Western Electric Company is a continuing one, and in order to supply its customers with the character of equipment which they require to give the best telephone service, this development work must be continuous, and the cost thereof must be recovered. In a business of this magnitude and complexity, in a rapidly changing art, detailed cost accounting in
1652 connection with each development would be burdensome and exceedingly expensive, and each item of product that we make is a composite of development over past years; any effort to allocate the development cost to an item of product would, in the last analysis, be an arbitrary one. Furthermore, to suspend development expense until some time in the future, when and if sales are realized, would be hazardous from a financial standpoint.

If a cost accounting system which would attempt to arrive at the approximate cost of the development work in connection with any particular project were to be attempted, the expense to both Bell and non-Bell customers would be substantially increased. Our present method is effective, economical in the conduct of the business, and equitable to the business and to our customers.

1653 The sales of our manufactured products represent the commercial utility of the ideas and inventions arising out of our development work, and every purchaser of our product must share in the expense of the development of those products. Keeping in mind that the development work is undertaken for the Bell System, any recovery of development expense through sales to non-Bell customers in excess of any development expense specifically incurred to do that business,

has lightened the burden on the Bell business of development expense especially incurred for that business. We recover our development expense in the prices of our products from both the Bell and the non-Bell customers on the same basis.

The Western Electric Company has taken out patents, from time to time, as a result of development and research in its Engineering Department prior to the organization of
1654 the Bell Telephone Laboratories, and by the latter company since its organization. It has, at the present time, arrangements with other companies for the interchange of patent rights.

From many developments, patentable inventions arise, which we have the right to use without taking out a patent. The policy of the Western Electric Company concerning the taking out of patents is to do so in order to protect itself against interference and claims of infringement. This protection is of primary importance, owing to the magnitude of our operations. We also have cross-license agreements with other industries whose fields of activity are such that their developments might have application in the field of operations of the Bell System.

I am familiar with the corporation known as Graybar
1655 Electric Company. It was organized to do the business in telephone apparatus and lead covered cable, and telephone and electrical supplies, formerly done by the Supply Department of the Western Electric Company. It also sells some of our special commercial products, but its largest business is in the purchase and resale of products not manufactured by the Western Electric Company. There has never been any interchange of patents between the Western Electric Company and the Graybar Electric Company.

From 1916 to the present time, the Northern Electric Company has been engaged in the manufacture of telephone apparatus and lead covered cable, electrical power wires and cable, and in the purchase and sale of telephone and electrical supplies throughout Canada and Newfoundland. The Western Electric Company has never controlled the Northern
1656 Electric Company, but has a 43.6 per cent interest in its

common stock. For a period of years, the Western Electric Company and the Northern Electric Company have had a contract for the interchange of patent rights, design and technical information, sales distribution and accounting methods, engineering and manufacturing service and advice, for which the Western Electric Company receives a 1 per cent royalty on Northern Electric sales of telephone apparatus to all of its customers.

1657 Under this reciprocal arrangement, the Western Electric Company has received relatively few patents, but has received some ideas of real and substantial value in its business in the United States.

A typical example of this is: enamel or japan type of coatings have been used as an insulation for fine wires for electromagnets for about 25 years. Over a period of years, experience with this process made it possible to apply this type of insulation to larger sizes of wire. When this stage was reached, our engineers recognized the value of using this type of insulation in place of the under-silk insulation on the wires of switchboard cables, especially in localities subject to high humidity.

1658 As the wires in these cables have a large number of soldered connections made to them, this copper wire must be tinned in order to prevent the oxidation of the copper and permit soldering readily. The commercial process of tinning wire that had been used up to that time resulted in an excess of tin remaining on the wire. When we came to apply the enamel coating to this type of wire, we found that the temperature of the enamel baking oven would melt the excess tin, with the result that globules and lumps of tin without insulation upon them would collect at frequent intervals along the wire. These lumps would often have sharp points on them, so that after the outer textile insulation was applied to the wire these lumps or sharp points would project through the insulation. When wire of this type was assembled
1659 into the cable, there would be frequent crosses or short circuits with adjacent wires. Consequently, large amounts of wire proved defective and had to be scrapped.

As we were, at that time, purchasing our tinned copper wire, we laid this problem before our suppliers, but, after many months of work with them, we had no success in overcoming the difficulty of removing the excess amount of tin on this wire.

The Northern Electric Company had been engaged for years in the manufacture of copper wire and tinned copper wire, and we laid our problem before them for consideration. In about 3 months' time the Northern Electric Company developed a rather novel process of tinning wire, which consisted of combining part of the wire drawing operation with the tinning operation. The new process utilized a wire about one-half gauge larger than was required, and as this wire emerged
from the tinning bath, it was passed through a diamond
1660 die of the kind that is used in drawing copper wire,
which die reduced the size of the copper wire to the desired size, and, at the same time, provided a smooth and even coating of tin without excess. This type of wire overcame all the difficulties in the enameling operations, and proved to be very satisfactory.

Over the period of 13 years in which we have been using this process, we tinned 50,000,000 pounds of wire and saved $6,000,000 in our business with the Bell associated companies.

That was the result of an idea that we obtained by this
reciprocal relationship between the Northern Electric
1661 Company and the Western Electric Company. The proc-
ess was patented by the Northern Electric Company, and we acquired the patent for the United States through our relationship and without expense to ourselves. In my opinion, the arrangement between the Northern Electric Company and the Western Electric Company is a fair one for both parties.

I am acquainted with the International Standard Electric Corporation. The Western Electric Company sold the stock
of the International Western Electric Company to the
1662 International Telephone and Telegraph Company on
October 1, 1925 (at which time the name was changed from International Western Electric Company to International

Standard Electric Corporation). Since then the Western Electric Company has not had any ownership of any kind, either directly or indirectly, in the International Standard Electric Corporation.

Since October 1, 1925, the International Standard Electric Corporation and its subsidiaries have been engaged largely in the design, manufacture, sale, installation and distribution of telephone apparatus and equipment throughout the world, outside of the United States, Canada and Newfoundland. It and its subsidiaries operate important manufacturing establishments in England, Belgium, France, Austria and Japan. At the present time, the Western Electric Company has a contract with the International Standard Electric Corporation whereby these companies exchange patent rights, de-
1663 signs, and technical information in connection with telephone and telegraph apparatus and systems, and information on shop processes, tools and machinery. Since October 1, 1925, the Western Electric Company has received a royalty from the International Standard Electric Corporation of one-half of 1 per cent of the latter's sales of telephone apparatus. It has also received patents and ideas of value in the prosecution of its business and particularly in the prosecution of its Bell business. The International Standard Elec-
tric Corporation has received from the Western Electric
1664 Company information for filing patent applications on 3,711 inventions, of which they have filed on 311 in one or more foreign countries.

The Western Electric Company has received from the International Standard Electric Corporation information for filing patent applications on 1,250 inventions, of which it has filed on 154 which it considered to be of value in its business.

Fundamentally, the basic art of telephone communication is the same the world over and the needs are quite sim-
1665 ilar, but the methods of accomplishing the result and the devices that are employed are frequently different. There are differences between countries of Europe as well as between Europe and the United States, and those differences,

very frequently, go down to differences between different places in the same country, or even different telephone subscribers in the same city.

There is far less standardization of practices and equipment in Europe, undoubtedly because of the differing tastes and customs of the people, and of national pride and the desire to foster local inventions. There is not the same utility abroad for these manufacturing developments of the Western Electric Company as there is in this country. The International Western Electric Company and the International Standard Electric Corporation maintained substantial development organizations abroad for the purpose of providing their
1666 customers with specific forms of apparatus and equipment, in order to satisfy the varying needs, tastes and customs.

In my opinion, the arrangement between the Western Electric Company and the International Standard Electric Corporation is a fair and reasonable one for both parties.

Before the Western Electric Company sold the stock of the International Western Electric Company, the Western Electric Company had had foreign business done through subsidiaries for a great many years. For the period from 1916 to 1919, that business was carried on by the Western Electric Company, Limited, of Canada. From 1919 to 1925, it was conducted by the International Western Electric Company, and it did business throughout the world, excluding the United States and parts of South America. The
1667 Western Electric Company and the International Western Electric Company interchanged patent rights, complete design and technical information, and full information on machinery, equipment, tools and processes employed in the manufacture of telephone apparatus.

I am acquainted with a concern known as the Siemens and Halske Company, which was a very large telephone manufacturer in Germany. As a result of the contractual relation between the International Western Electric Company and

Siemens and Halske, the Western Electric Company acquired the American rights to the Siemens and Halske inventions.

(Objections by Mr. Adcock that the contract would speak for itself and a request made for a copy of the
1668 contract. Mr. Thompson pointed out to the Court that he was merely proving the fact that such rights were given by Siemens and Halske to the International Western Electric Company and that the contract was not in any way involved.)

1670 I was in Europe at the time the contract was executed and came in personal contact with acts under the contract, and I know there was that exchange of patent rights, irrespective of any knowledge of the terms of the contract.

1671 (The Court ruled that if the matter was not brought up again, it would assume that counsel for the plaintiff had satisfied defendants' attorneys with respect to the contracts.)

1672 The sales and manufacturing activities of the International Western Electric Company in the foreign field were interrupted from 1915 to 1919 by the war. Scientific and engineering minds were devoting their time to developing instruments of war, and manufacturing facilities were devoted to the production of war materials and supplies. Consequently, little effort was devoted to peacetime activities. Therefore, for the five years from 1915 to 1919, the International Western Electric subsidiaries were devoting substantially no effort to the development of
1673 the telephone art, and receiving substantially no advantage from the rights acquired from the Western Electric Company, because their sales were largely of war materials, or of telephone materials particularly adapted to the conduct of war.

In connection with the manufacturing business conducted in the foreign field by the International Western and its subsidiaries, there was a distinct hazard. It had established factories and investments in physical properties and plants

in many nations in Europe and in the far East, and the businesses in those locations were subject to the laws, rules and regulations of those countries and the hazards were far greater than those of the Western Electric Company.

1674 The arrangement which existed between the International Western Electric Company and the Western Electric Company was a fair and reasonable one in my opinion.

Electrical Research Products, Inc., is a wholly owned subsidiary of the Western Electric Company, which commenced business on January 1, 1927, and took over a portion of the non-Bell assets of the Western Electric Company, including the exploitation of certain special commercial products.

Some of our ideas and inventions developed for the Bell System have application in other fields; some of them are applicable directly in the form used by the Bell System; in other cases, in order to develop a product of commercial utility, further specific development work was necessary. The term "special commercial products" is applied to the

1675 products upon which further specific development work must be incurred in order to make them available for commercial use. (Hereafter Electrical Research Products, Inc., will be referred to as "Products".)

Since the formation of Products, the Western Electric Company has not incurred any development expense specifically in connection with the apparatus manufactured by it for Products. That development is paid for by Products. The special commercial products which are dealt in by the Products Company are manufactured almost entirely by Western Electric. When Products was organized, there was not an established business in such articles which was turned over to Products. The Western Electric Company had sold about a million dollars worth of sound recording and reproducing equipment in 1926, but there was no established business in any sense of the term.

When Products commenced business, its first em-

1676 ployees were former employees of the Western Electric Company. There were 25 of them. Products had to

build up an organization of its own, including executive, administrative, financial, accounting and engineering departments. It had to build up a nation-wide organization of skilled engineers and mechanics for the installation, servicing and inspection of sound reproducing equipment installed in theatres and other places. It had to establish a large or nation-wide sales organization; it solicits licensees and contracts with them; it offers a financial service to customers who desire to pay on a time basis. It exercises supervision over an export business, maintains warehouses and carries stocks of finished merchandise.

1677 It had to establish an organization to handle music rights, in connection with the music programs used with the sound moving pictures or apparatus which Products sells or leases to its customers.

Money was risked in this business in order to carry on its operation and there was a distinct hazard; in the beginning it was difficult to interest motion picture producers in the sound picture idea, which was later to revolutionize their industry. In the first year, as well as in 1931, the Products Company incurred losses, while in the intervening years there were substantial profits made.

Over the past five years, practically all of the motion
1678 picture theatres in the United States have been equipped for sound motion pictures. The potential market in this field lies in the application to existing theatres of improvements in the art and mechanisms, and providing for a normal growth in the industry. There has been some work done in the application of sound motion pictures to advertising and training in the industrial field and also in religious and educational fields. However, there is no immediate prospect of any substantial development in those fields.

I am familiar with Plaintiff's Exhibit A-82, showing the income from the Western Electric royalties and patents sold, and expenses applicable thereto, for the period 1916 to 1931, in relation to the Western Electric Company, the International Western Electric Company, the International Standard Electric Corporation and the Electrical Research

Products. In my opinion, the arrangement which exists between the Western Electric Company and Products is a fair and reasonable one.

1679 The Western Electric Company is engaged in business on a far larger scale than any of the foreign companies conducting the business of manufacture, sale and installation of telephone apparatus abroad. When the Western Electric Company grants a patent right in the foreign field, the relative utility of such patent right is small as compared with the utility of the patent rights which it receives for use in this country; the relative field of usefulness is large in proportion. On the average, the sales of telephone apparatus in the foreign countries which have received our rights are, as a total, from one-fifth to one-sixth the sales of telephone apparatus made by the Western Electric Company.

The Western Electric Company locates its plants on the basis of a comprehensive economic study from the standpoint of cost of products delivered to the Bell System as a whole. The scope of the study includes the probable cost of land and buildings, transportation costs, the cost of materials

1680 delivered to the factory, the cost of labor, the adequacy of the labor supply and the transportation facilities for labor.

We have learned that for a long continuing business such as ours, the best building construction to employ is brick, steel and concrete, and that is what we employ. That type of construction is most economical from the standpoint of maintenance and economy of repairs and of minimum insurance rates.

The manufacturing activities of the Western Electric Company are carried on in a few locations to take advantage of the concentration of the requirements of the operating companies of the Bell System, and it is essential that we mass

1681 those requirements, in order to obtain the advantage of mass production and consequently low costs. Therefore, we operate large unified factories in a few locations.

We have learned over a period of years that for a specialized business of the nature of ours, we can obtain the best building

designs and insure the most economical building construction by maintaining our own organization of architects and engineers, who are intimately acquainted with our products and processes and the equipment that we employ in our manufacturing operations. This corp of architects and engineers does not have to be educated into the needs and requirements of our buildings, as would be the case if we employed outside architects and engineers. We also maintain a Construction Department, which acts as general contractor in the construction of our buildings, thereby saving from 5 to 10 per cent in the cost of buildings, which saving is reflected, of course, in our investment account.

1682 Many of our products being of a specialized nature for which there is no machinery available on the market, we design and build that machinery. Other products are made in such large volumes that we find it economical to design classes of machinery which have higher productivity than the machines available on the market, so we design and construct those machines. Tools, which are a specialized facility for the manufacture of a particular design or device, we build ourselves, except such things as drills, chucks and standard tools of that kind, which are available on the market. We operate at each of our works a design organization for tools and machines and a tool building organization. Occasionally, under great stress, we find it necessary to go outside to specialty tool manufacturers, to have tools built for us.

1683 Our experience is that it is more expensive to have outsiders build our tools for us and is not so satisfactory, and frequently repair and maintenance costs are higher and average life shorter. This practice in connection with our tools and machinery is reflected in lower investment and lower maintenance and repair costs. We build them and they go into our investment account at cost. If we bought them, there would be a commercial sales expense and profit paid to someone.

The Hawthorne Works was established, in a small way, in 1905. It grew rapidly, and in 1923 we were creating an 1684 undue drain on the labor supply and a strain on the

transportation facilities for the labor, so we started a plant in Kearny, New Jersey. That plant grew more rapidly than the available market for labor, so we laid our plans for another plant at Point Breeze, Baltimore, Maryland. Each plant on these new sites is laid out according to a fundamental plan, which determines the occupancy of the property with buildings of different kinds and an arrangement for properly co-ordinated manufacture.

1685 This planning insures a type of building suitable for the class of products that are to be manufactured in it for years to come, and, therefore, eliminates the necessity of tearing down the old buildings to accommodate plant growth, as it insures against errors in the location of the buildings, and avoids obsolescence.

The Western Electric has distributing houses in over 30 cities in the United States, devoted to warehousing of materials and the operation of repair shops in the service of the local telephone companies. In all but six, we operate in rented quarters. These six have been well located with respect to service to the telephone companies, and with

1686 respect to both railroad and truck transportation facilities. Those six are of steel, brick and concrete, thoroughly modern, well designed and admirably adapted for the purpose for which we use them.

The bulk of the property of the Western Electric consists of the manufacturing plants listed in Exhibit A-92 and the equipment and machinery located in them.

At the Hawthorne plant, we manufacture lead covered cable of both the exchange and toll type, and also step-by-step and panel type dial central offices, and certain other miscel-

1687 laneous telephone apparatus products and certain special commercial products. At the Kearny Works, we manufacture exchange type of lead covered cable, manual central offices and P. B. X. equipment, carrier and repeater type equipment for toll service, and certain special commercial products.

At Point Breeze, we manufacture toll lead covered cable for the Bell System in the eastern area and for the Pacific

coast, rubber covered wire and certain types of sub-station telephone apparatus.

At the Queensboro Works, we manufacture the requirements of the eastern area of the Bell System for telephone booths, certain wood desks and tables and specialty wood products.

The Hawthorne plant, located on the western boundary of Chicago, consists of a tract of 200 acres bought in 1903 1688 for $575,000. It is rectangular in shape, giving maximum utility in the layout of a manufacturing plant. It has exceptional transportation facilities, including direct connection with the Burlington and Illinois Central Railroads, and the Belt Railroad runs through the property above grade. It is in every way admirably adapted for our purposes, and I do not believe that there is any property, developed or undeveloped, in the vicinity of Chicago that would be more satisfactory than that which we have at that plant. The buildings are steel, brick and concrete, specially designed for the purpose for which they are used, and contain 4,000,000 square feet of floor space. Although some of the buildings are 25 years old, they are just as well adapted for the purpose for which we use them as the modern ones that we have designed. These buildings cost $19,200,000, and the service equipment, including the power plant for both steam and electric generation, gas plant and service distribution facilities to the 1689 various buildings, cost $6,800,000. What I have said generally about the Company's policy as to maintenance and repair is applicable to the buildings at Hawthorne. Any buildings that prove to be inadequate or obsolete are immediately torn down and written out of the investment account, and the buildings used are maintained in a high state of efficiency.

The Kearny Works are located on a tract of about 148 acres, between the Passaic and Hackensack Rivers, on the Jersey Meadows, at Kearny, New Jersey. The land, including filling, roadways and bulkheads, cost $3,250,000. 60 acres were acquired in 1923, and the balance in 1929. This tract also is rectangular in shape and therefore of maximum utility. The

plant was started in 1925, and is, therefore, new. It was built of steel, brick and concrete, and is thoroughly mod-
1690 ern and well suited to our purposes. The buildings have 2,850,000 square feet of floor space, and cost $22,900,000, and the service equipment, including the power plant, with both electric and steam generation facilities, and distribution facilities, cost $5,900,000. The buildings on the recently acquired tract present quite a contrast to the buildings erected on the original tract, which were on the land when we purchased it. They are not of the substantial construction of our own buildings, the cost of maintenance and repair is greater; nevertheless they can be used for our purposes, although they cannot be occupied as economically nor as efficiently operated. We contemplate abandoning those buildings in about 8 or 10 years, but, in the meantime, we figure we will be able to use them quite satisfactorily in our operations.

The Point Breeze plant consists of 179 acres of land
1691 near the eastern boundary of Baltimore, Maryland. It is located on the Patapsco River, which runs into the harbor of the City of Baltimore. This property cost us about $3,000,000, including the filling, bulkheads and roadways. The property is not rectangular; it is about seven-eighths of a mile long and one-third of a mile wide and lends itself very well to occupancy with rectangular groups of buildings. The land was purchased in 1929, and the first manufacturing operation got under way in the latter part of that year. The buildings are of steel, brick and concrete and thoroughly modern, comprising 800,000 square feet of floor space, and cost $6,200,000. The service equipment, which is of the same kind as I have heretofore described, cost $3,700,000.

Transportation facilities are excellent, the plant having railroad and highway facilities as well as deepwater transportation by way of the Patapsco River to Chesapeake Bay.

1692 The Western Electric Company bought the Queensboro Works from a company which for years had been supplying us with the Bell System's eastern requirements for telephone booths. The plant is located in the Borough

of Queens, next to the Borough of Brooklyn, in the City of New York. The land comprises about 26 acres and cost
1693 $1,500,000. The buildings were constructed about 4 years ago by the previous owner. They are of steel, brick and concrete, and thoroughly adapted for the purpose. They comprise 100,000 square feet of floor space and cost $530,000, and the service equipment cost about $50,000.

As to the use of fundamental plans in the construction of our manufacturing plants, such a plan necessitates a thorough study from an overall standpoint of the activities and scope of the specialized industry. The purpose is to visualize
1694 the future and insure against error in the location of buildings and in the size of buildings, as these matters have an important bearing on the cost of manufacturing operation. The proper location of a building tends very much to reduce costs.

Furniture and fixtures is a classification which includes shop benches, stools and chairs, steel stock racks, all handling devices, such as trucks, trays, pans, boxes, even motor vehicles, and, of course, office furniture.

The machinery, tools and fixtures used by the Western Electric Company are the best we can buy or build, consistent with the purpose for which they are used. Our invest-
1695 ment in this class of equipment is roughly as follows: Hawthorne, $52,500,000; Kearny, $22,900,000; Point Breeze, $12,300,000; Queensboro, $325,000; a total of a little over $88,000,000.

The products we manufacture are designed by the Bell Telephone Laboratories. In the latter stages of design, and before final approval is placed on the design, models of the design are submitted to the Manufacturing Department of the Western Electric Company. The models are considered by a group of experts, who bring to bear upon this design their knowledge of the manufacturing art and determine if the mechanics of the design are such that it will facili-
1696 tate manufacture and yield the most economical manufacture and, consequently, the lowest cost. Consideration of this kind given to a new design results in suggestions

to the Bell Telephone Laboratories for slight modifications in the design here and there that will make it possible to manufacture more cheaply. These comments are furnished the Bell Telephone Laboratories, with the estimated cost of production of the article as the model was submitted and the reduction in that cost if the changes suggested by the shop engineers can be adopted. As a result, a final design is employed which is a compromise, and the design is the result of co-operative effort between the engineers of the Bell Telephone Laboratories, from a design standpoint, and the engineers of the Manufacturing Department of the Western Electric Company, from a manufacturing standpoint.

That is the first step in manufacturing planning. Further manufacturing planning takes place after the stamp of approval has been placed upon the design. At the time the final model of the apparatus is sent to the Manufacturing Department of the Western Electric by the Bell Tele-
1697 phone Laboratories, the first operation is to make complete drawings, part drawings and assembly drawings.

The part drawings give the dimensions of each of the parts, with the tolerances that will be permitted. The object of the tolerances is to define the limits within which the manufacturer is to be held so the part will go together with adjoining parts without filing or fitting; it provides what we term in the manufacturing industry interchangeable manufacture.

The assembly drawings show the assembly of the different parts and their proper relation to each other. These drawings also give the testing requirements to which the finished apparatus must be subjected, in order to be sure that the products will meet the requirements of the designing engineers.

The next step in planning is on the part of the manufacturing experts, who, taking the drawings of these parts, which also specify the kind and quality of material to be used in their manufacture, determine the exact process, and
1698 each step in the process, to be employed for the manufacture of parts. They will determine, for example, if it is to be made out of sheet metal, the economical size of

the sheet, in order to get the greatest number of parts out of that sheet, and from that they determine the amount, in pounds, of raw material required per unit number. They specify each operation and determine the tools and character of tools that must be designed and built in order to manufacture that part. They determine the design of the gauges to determine that the part, as it progresses through manufacture, has been properly produced.

This manufacturing planning is constantly carried on by the Western Electric Company, and that has been true during the period we have been discussing. This planning has an effect on the cost of the manufactured article. The manufacturing planning by men who are experts in their
1699 portions of the art of manufacture to determine the process of manufacture, the equipment to be used, the design and construction of the equipment, etc., produces the lowest cost for the manufactured product.

The final result of this manufacturing planning is a manufacturing analysis, in which is shown the operation to be produced, the tool, and the number of that tool that is to be used, the machine upon which that tool is to be placed and the gauges that are to be used, and also the grade of labor that is to be employed in that operation.

By "grade of labor", we mean the degree of skill required to perform an operation. In a large manufacturing establishment, there are all kinds of operations employed, some very simple and others intricate and delicate, requiring
1700 the highest degree of skill. In the removal of burrs in drilled holes, the labor employed is not skilled, is the simplest grade and is the cheapest. In the manufacture of tools, the very highest skill is required, and the highest price is paid for that class of work. For each of these skills or grades of labor, there is established a range of pay, and those wage ranges are determined in accordance with what other industries in the local market are paying.

This grade of labor study, in my opinion, insures the lowest cost, inasmuch as we determine it for each operation that is to be employed as a result of experience. We do not use higher

skilled labor than is necessary, and that has the tendency of keeping our costs as low as possible.

We are a firm believer in incentive methods of payment
1701 for our labor, and we think that the individual should be given the opportunity to demonstrate his ability, his worth, and that he should be able to measure his ability and his worth relatively with his fellow employees. About 80 per cent of our factory work is paid on the piece work basis.

The selection of employees for a manufacturing establishment is most important. We aim to employ a high grade, intelligent and efficient type of employee. When a new applicant arrives, we endeavor to determine what similarity there is between the experience he has had and the classes of work in our business, so we can devote our efforts to getting
1702 him located in a class for which his past work has adapted him. We have various aptitude tests, which are not perfect, but which help to get the employee in a class of work where he will become most productive and derive the greatest satisfaction for himself in the shortest time.

We give the new employee a physical examination, such as is required for insurance, and try to discover physical defects if they exist, so that we may take these into consideration in locating the man in a class of work where such defects will not be a handicap to him. The new employee is subjected to our various training plans, in order to place him where he can demonstrate and utilize his fullest ability and earning power in the shortest time.

1703 The training and the physical examination of employees and the other things I have described result in better satisfied employees and in placing them in positions where they are capable of rendering the best service to the Company. All this has a most decided effect on the Company's manufacturing costs, as it is essential that the employee be satisfied and content, and that he is earning a satisfactory wage and being presented with an opportunity for progress. That all results in having a state of morale which in itself reflects low costs.

We take about every step possible to insure the safety of

our employees by thoroughly guarding our tools and the machinery. We try, in all instances, to make our equipment fool proof from the standpoint of safety. The prime factor in safety is education in safety. Through our employee publications we have written articles on safety particularly applying to the Works, and we conduct free first aid classes. I
1704 think some 15,000 of our employees have taken that first aid course in the last 4 or 5 years, all for the purpose of having our employees conduct themselves safely in their employment. We have a lot of interesting statistics, recently compiled, which show that at the Hawthorne Works there are fewer lost time accidents per 1,000 employees during their working time at the factory than during the other hours of the day when they are away from our factory.

At each of our work locations, the employees have organized a club for educational and recreational activities.

(Mr. Adcock objected that this testimony had no bear-
1705 ing on the case. Mr. Thompson stated that this testimony had a bearing on the reasonableness of the profit made by the Western Electric Company on its Bell System business; that it showed that the Company's plants are well located, well arranged and carefully planned, and had been built at a low cost (these are the figures which appear in the average investment mentioned),
1706 that the tools and machinery are efficient, that the Company takes every reasonable precaution in the training of its employees so that they may be well satisfied in positions that are adapted to them, and that, therefore, the costs of these manufactures which go out to the Bell associated companies are kept at the lowest possible level. The objection was noted and the witness was permitted to proceed.)

These clubs, with the assistance of the management, conduct
1707 evening schools in various subjects which pertain to the business, for the purpose of giving the employees the opportunity to better their knowledge of these subjects and to assist in their promotion in the business. All kinds of

recreational activities are fostered and facilities provided for them by the Company.

Manufacturing effort in a large industry is an organized effort, it requires team play to accomplish the working result. Anything that will encourage team play, whether that be in recreation or diversion, will contribute greatly to the satisfaction, contentment and morale of the people who are grouped together in their daily work. I believe all these activities make for better satisfied employees and lower costs in the business.

1708 We also encourage thrift among the employees, by offering to them the privilege of subscribing to American Telephone and Telegraph Company stock on an installment basis. We encourage them to authorize us to deduct small amounts from their weekly pay for deposit in a savings bank designated by the employee. We also operate a payroll deduction plan upon authorization by the employee in cooperation with an insurance company in payment of premiums on an installment basis for life insurance. Thrift activities in the last two years have resulted in our employees authorizing deductions from their pay of about 12 per cent of the annual payroll.

We have specifications for our raw materials used in manufacturing, and these specifications are compiled by our raw material engineers with the idea of defining the requirements that must be fulfilled in order to insure that, when used in our manufacturing operations, they will produce satis-
1709 factory products. These specifications form the basis upon which our Purchasing Department buys our raw material on a strictly competitive basis, and they are, therefore, certain that the material which they buy will be satisfactory to us.

We manufacture some of the raw material which we use in the business of the Western Electric, such as copper wire, hard rubber (sheet and tube), various kinds of phenol fibre, some glass products, porcelain products and certain carbon products. We also manufacture some primary raw materials from scrap, such as lead covered cable and line wire which

have been removed from the Bell System. We recover all of the lead sheaths and all the copper for re-use in new cable. As a result of this practice which we follow of manufacturing a portion of our raw material, we have most decidedly reduced the manufacturing costs of the Company. I am certain
1710 that our practice of making raw materials either from new or scrap materials has resulted in economies that run well over a million dollars a year.

We have a group of engineers known as cost reduction engineers. It has been our experience that if you expect to advance the art of manufacturing, you have got to organize for it, and we have set aside a group of 450 engineers, including scientists, devoted to that work.

We are spending in the neighborhood of two million dollars a year on this class of work, and over the period of years represented in this case, from 1916 to 1931, we have spent in the neighborhood of thirteen million dollars on cost reduction work and have realized savings by reason of that work of many times that amount.

1711 An example of cost reduction is found in connection with cable manufacture. Up to comparatively recent months, the conductor wires in lead covered cable have been insulated by a narrow ribbon of paper about one-quarter inch wide by two and one-half or three one-thousandths inch thick. This paper is wrapped around the conductor spirally and at relatively high speeds—about 3,000 revolutions per minute. As this paper is rather fragile, the strains placed upon it by this high speed operation are great and, therefore, a high quality of paper is required. In order to obtain the proper quality, the paper manufacturer finds it necessary to use manila fibre as the base for the paper. The source of this fibre is old rope abandoned from sailing vessels. Over a period of years, as our requirements for cable grew, the requirements for cable paper grew and the supply of old rope was decreasing so that our costs of paper were steadily increasing.

We assigned an engineer to the job of finding some other fundamentally different method of insulating the conductor

wires. He evolved the process of combining the paper
1712 making operation employed by the paper manufacturer with the insulating operation employed by us, and produced a homogeneous tube of paper around the wire. This process removes all necessity for a high quality paper, and we, consequently, are able to use ordinary wood pulp. This new process is effective to-day on about 60 per cent of our exchange type of cable. On a normal basis, when we are fully equipped, the economies from this process will be about $600,000 a year.

As head of the Operating Department of the Western Electric Company, I am familiar with the standard shop costs used by the Company. There are three elements in a manufacturing cost, labor, material and expense, the latter sometimes called overhead or loading. The labor element in standard cost is the ideal, absolute minimum amount of labor
1713 that can be employed to perform a particular operation. The basis would be the piece work rate per thousand of the part operation. That assumes that the tools are set up and the work so conducted that the operator could go along continually without any interruption or break and produce parts at that rate per thousand. That forms the basis of the labor element in the cost. However, we have to take into consideration an experience factor, derived from our records in the conduct of a particular class of work, to cover the time when that operator will not be actually performing the operation.

For example, it may be that in the blanking operation the manufacturer who supplied the raw materials did not shear the strip of material quite straight, so that, as the operator was passing this strip of material through the blanking die, it stuck in the die, and the operator could not get it out, but had to stop. He would go to the gang boss and tell him his troubles and the gang boss would come back with the
1714 operator and assist him to free that strip of material from the tool, so that the operator could proceed. We will assume that from ten to fifteen minutes have been consumed in this interruption and the operator must be paid for

that time, and a time ticket is put in paying him for that time, although we get no production out of that operator. Another example is in the case of an operator who clips his finger on the edge of the material; he has to go over to the first aid department to get it dressed and ten or fifteen minutes would be lost in doing that.

We first have the ideal labor cost, and then, in order to arrive at the standard cost of labor, we take into consideration factors of that kind. The experience factor would
1715 cover such things as vacations with pay, time off for sickness, etc.

In connection with the material cost, the same thing applies. The basic or ideal cost of material is the minimum amount of material that is required, we will say, to produce a thousand parts. To that we add an experience factor, which is based on our cost records of the past, and it takes into account the waste on account of the material required per part not being exactly divisible into ten lengths of materials.

For an example of this, I will again take the case of blanking a part out of sheet metal. We will assume that eighty parts can be produced out of a strip of material of exactly five feet; that is, one part is produced out of every multiple of two inches. We buy our raw material in from five to eight foot lengths. We cannot get it all exactly the same length without paying a premium for wastage to the raw material manufacturers, and so we buy it in lengths of, say, from five to eight feet. If the particular strip of material happens to be
1716 five feet one inch long, we get no more parts out of it than if exactly five feet long, so the cost of that extra material enters into the experience factor that we take out of our records of the past.

A thousand things happen in connection with manufacturing operations, and all of the parts that are produced are not good; some of the parts have been spoiled in setting up the tools for subsequent operations; there is a waste of material; and some parts go to the scrap heap. The cost of material entering into those parts enters into this experience factor that comes out of the records of the past to be added to the

absolute minimum material costs, in order to make the standard costs of material.

The matter of overhead is treated in somewhat the same way. There is an experience factor added to the ideal or minimum from that standpoint. After having taken the records and experience of the past and applied them to the ideal, we look forward to our cost reduction and our en-
1717 gineering work to determine what improvement, what new tools and equipment will be brought to bear on the manufacture of those products within the coming year that will result in reducing the cost of manufacture of those products, and we determine about when during the year they will become effective, and weigh that with the year's production, and adjust the standard shop cost accordingly.

All those elements that I have described are taken into consideration in arriving at the standard shop costs which are used by the Western Electric.

The fact that we have taken on the manufacture of raw materials that we formerly purchased is evidence that we can economize in our operations by bringing to bear our own engineering knowledge on the problems of others. In every case where we have undertaken the manufacture of raw materials, we have done so at from 20 to 50 per cent less than
1718 we were paying for them before. Of course, in making the comparison with the price of the supplier, we must allow for commercial expense and profits, but the spread is so great that after making that allowance I feel satisfied that our costs are below the costs of the manufacturers.

We make it a point to maintain friendly relations with all kinds of manufacturing establishments, and one or more groups of our engineers have visited practically every important manufacturing establishment in the United States, some having been sent to Europe to study methods and processes and equipment employed in Europe, not only in the telephone industry but in all other types of industries, in order to bring back and apply such things of value as they have found to the operations in our business.

1719 In my opinion, during all the period covered by my experience with the Western Electric Company, its plants and machinery have been well designed and constructed, and operated efficiently by trained and skilled employees, and the Company's operations have been economically conducted.

1720 *Cross-Examination by Mr. Haight.*

March 22, 1932.

The Northern Electric Company, the International Western Electric Company and the International Standard
1721 Electric Company had design departments; I cannot say that they had research departments. They did nothing in the way of fundamental research. Prior to the designing, they did an engineering development job, by which I mean the development of physical devices to be made.

1722 "Q. And in what way did the non-Bell customers—I am now speaking of the Western Electric again—in what way did the non-Bell customers pay for the benefits derived from the fundamental research by the American Telephone and Telegraph Company, which resulted finally in the embodiment of those inventions in products made by the Western Electric Company?

"A. They shared in the development work, or development cost of those products, and in some cases paid royalties.

"Q. I am afraid you did not get my question. I am speaking now only of the non-Bell customers of the Western Electric Company, and I will put it to you directly, so that you will be sure of what I have in mind. Is it not a fact that those non-Bell customers made their payment towards the development and research work that finally appeared in the products sold to the non-Bell customers by the Western Electric Company, by an increase in price to those non-Bell customers? Such payment as a non-Bell customer makes for that work, appears in the price he pays for the goods?

"A. No; development expense was included in the cost

upon which the price was based, and in addition, royalties were paid."

1723 On all the so-called restricted apparatus built by the Western Electric Company and sold to the non-Bell customers, we are required to pay a royalty to the American Telephone and Telegraph Company. I would not say that the non-Bell customers finally got the results of the development and research work done by the American Telephone and Telegraph Company for nothing. I think that they shared in paying for them through development expense that is in-

1724 cluded in the cost upon which the price of the products is based.

We pay the American Telephone and Telegraph Company royalties for restricted apparatus. By "restricted apparatus", I mean certain classes of apparatus on which the patents are held by the American Telephone and Telegraph Company, which we are released to manufacture and sell to other than the Bell System Companies upon payment of a royalty to the American Telephone and Telegraph Company.

If there is any research expense incurred in connec-

1725 tion with the development of the fundamentals in connection with the switchboard, the American Telephone and Telegraph Company paid for it and not the Western Electric Company. The Western Electric paid for its own development work in connection with it. I guess the non-Bell customer of the Western Electric Company does not pay for the development and research work done by the American Telephone and Telegraph Company with respect to those things for which the Western Electric Company pays nothing.

1726 At the time the Western Electric Company entered into the contract with the International Standard Electric Company for the interchange of patents, the International Company received the right to make use of the patents and inventions that had previously been obtained by the Western Electric Company and the American Telephone and Telegraph Company. The exchange of patent rights between the Western Electric Company and the International Standard

Electric Company was a part of a deal in which the Western Electric Company sold to the International Standard the physical assets of its foreign business, its going value and its patent rights. So all of these rights then in existence were part of the consideration in that transaction.

1727 I said on my direct examination that the Electrical Research Products Corporation dealt in certain of the Western Electric Company special commercial products, which is a class of products which used the basic invention or development that came out of the telephone art but upon which further specific development work was required in order to put the invention in a form for use in the commercial field outside of the Bell System; Products Company

1728 pays for that further development work. The Products Company did not pay for any development work that had been done in perfecting a device for the art of telephony up to the time it was lifted out of telephony and put over into, for instance, movietone.

1729 Siemens and Halske did fundamental research work. The General Electric Company and the Westinghouse Company conduct fundamental research work. The Teletype Corporation undertook fundamental research, prior to

1730 its purchase by the American Telephone and Telegraph Company, as applied only to printing telegraphy. The Department of Development and Research of the Teletype Corporation still continues to do that fundamental research in its particular field. The foreign subsidiaries in Europe, of which I spoke in my direct, had no fundamental research departments as such. Their work was largely confined to the development of physical mechanisms to be used in the communication field. So far as results of fundamental research work appeared in the products dealt in and used

1731 by them, that was transmitted to them from the Western Electric Company or from any other source that they may have been able to gather it.

"Q. The Electrical Research Products Company, you said in your direct examination, at the time of its organization took over 25 men from the Western Electric Company. In

order to shorten my question, I am going to read to you a paragraph from the Western Electric News of April, 1929, and when I have read it, I am going to ask you if that is correct. It is referring to the Electrical Research Products Company, and it states:

'On January 1, 1928, there were on the payrolls of the company 189 names. On October 1, there were 776 employees, and by the end of the month the figures had mounted to 925 men, and is now'—

"That is, the date of the article, April, 1929,

'—over the 1,400 mark, and is still growing.

'These employees might truthfully be considered as picked men. To its field division, men were drawn from the installation and manufacturing departments of the Western Electric Company; from the operating and engineering departments, telephone and other public util-
1732 ity companies, and from the Bell Telephone Laboratories.

'Its staff men were recruited from the commercial, accounting, purchasing and secretary's departments of the Western Electric Company; from the Bell Laboratories; from the American Telephone and Telegraph Company; and from the graduating classes of engineering schools; and from other sources.'

"Can you tell me whether or not that is a correct statement of the situation?"

I do not recall the figures representing the number of employees in the Products Company during that period; it recruited its men from all over the Bell System as well
1733 as from outside of the System. So far as the sources of the men, and where these picked men were obtained, the statement is correct.

I do not know what reason the Paramount Company had for entering into its contract with the Electrical Research Products Company for talking movies. I do not recall that a letter, stating that the reason was to enable the Western Electric Company to go into immediate production and the Electrical Research Products Company to go into immediate service, was

used as advertising by the Products Company at that time.

1734 The prices to both Bell and non-Bell customers are based upon an estimate of current shop cost, plus expense and plus profit. We arrive at the profit in order to obtain a satisfactory return on the investment. The price-setting organization is furnished by Mr. Gregory with a picture of the going rate of business and a forecast of profit for
1735 the business and the return on investment that we expect to obtain currently. The basis of the "satisfactory return" is that we figure we should have a return of at least 10 per cent on the investment.

The last price reduction made by the Western Electric Company on its telephone apparatus was in 1929, on the basis of the going rate of profit and on a forecast of the volume of the business expected in the immediate future together with the return on investment that would be yielded by that
1736 business. In the fall of 1930, we increased our prices. I think generally other manufacturers do not increase prices in times of depression and I think also that in the commercial business they do not establish their prices on the basis of a look into the future, either.

We have looked upon the special commercial products business as one with considerably more hazard to it and one that is not necessarily a long continuing business. We get our profit out of that business as we go. We could not look so far into the future with respect to that business. I do not happen to recall any other manufacturers of any size that have been raising their prices during the depression period.

1737 The Point Breeze plant was established first for the manufacture of lead covered cable and rubber covered wire, with a view of later establishing a telephone apparatus shop there. The economic study indicated that the Pacific coast telephone companies' requirements for the toll type of lead covered cable could be more economically produced
1738 and shipped to the Pacific coast from the Point Breeze plant than from the Hawthorne plant here in Chicago.

The telephone apparatus plant at Point Breeze has not yet been constructed.

The Kearny Works, so far as cable was concerned, was built to supply the eastern part of the United States, but that was not true so far as telephone apparatus was concerned.

The Illinois Bell Telephone Company undoubtedly purchases telephone appliances made at Kearny or Point Breeze. If they use manual or P. B. X. equipment it comes from the Kearny plant. If they use certain lines of sub-station equipment or rubber covered wire, those items come from the Point Breeze plant. No part of the machine switching equipment of either type comes from either Kearny or Point
1739 Breeze. I do not know whether it is a fact that the Illinois Bell Telephone Company purchases most of its telephone appliances from Hawthorne; but I should imagine that it does. It is not true that the eastern telephone companies purchase most of their appliances from the eastern factories, because the greater portion of our production is from our Hawthorne plant here in Chicago. The eastern companies, generally speaking, purchase from the eastern plants those things that are manufactured in the east.

The Hawthorne plant manufactures both the exchange type and toll type of lead covered cable. It manufactures both the step-by-step and panel type of central office equipment. It manufactures loading coils for use in toll circuits and special classes of commercial products. The Kearny organiza-
1740 tion manufactures only the exchange type of lead covered cable. It manufactures manual central office and P. B. X. equipment, carrier current and repeater equipment for use on toll circuits, and a few classes of special commercial products. The Point Breeze plant manufactures only the toll type of lead covered cable; it manufactures rubber covered wire and some few types of sub-station instruments.

I do not believe that there was any portion of either the Kearny or Point Breeze plant that was vacant and idle in 1930 and 1931. The activities, of course, of both of these plants are below normal. There are no parts of these plants

which have never been used since they were constructed.
1741 The investment on which we think we should receive 10 per cent is the gross investment less current liabilities. I mean by "current liabilities", our payables. I do not happen to recall what is set forth in the annual
1742 report under "current liabilities", so I do not know whether they are the current liabilities which I have in mind. The things I am calling current liabilities are, of course, our payables. I had nothing to do whatever
1743 with the preparation of the balance sheet in the annual
1744 report. By "investment", I mean every dollar that is invested in physical property utilized in the manufacture of our products, that is invested in finished merchandise, processed merchandise, raw material and cash to do our business; from which should be deducted the payables we owe for material that we have bought. I would include a payable to a bank due in 90 days among the payables to be
1745 deducted if I bought raw materials from the bank. What I said should be deducted was any money that we used to buy raw materials; the raw materials that had not been paid for would be a payable.

I do not know how many definitions are employed in the Western Electric Company of current liabilities, and I do not know whether there is more than one such definition. I have read the annual reports of the Company. I sometimes contribute to the written matter of those reports.

1751 The employees of the Western Electric Company purchase the stock of the American Telephone and Telegraph Company on the same basis that it is purchased by the employees in other parts of the Bell System; that is, on the installment plan. The Company deducts installments from the pay of the employee and remits them to the American Telephone and Telegraph Company and the Western Electric does not charge anything for the work done.

1752 Inasmuch as our sales vary from year to year, and the bulk of our sales is conducted through distributing houses, I should say that the distributing houses do not get

the items of manufacture from the various factories of the Western Electric Company in the same ratio for each year.

In connection with the location of buildings and their plan and character of construction, tools and machinery, special equipment of various kinds, safety appliances, and so on, of which I spoke yesterday, I think perhaps some of our basic methods may be the same as those followed by other manufacturers of large size and good standing. The application of those methods and the development of particular methods for our own specialized products, have been developed by
1753 our own planning and engineering organization. I stated that we maintained a large engineering organization at our Works for the express purpose of developing and improving the manufacturing art as it applied to our business, looking towards a reduction in the cost in the manufacture of our products. I stated also that we made it a point to have our engineers visit other establishments around the United States and also in Europe, with the idea of gathering such ideas and improvements out of those businesses as might be adapted to and made applicable to our manufacturing business. This was all done with the idea of improving our processes and equipment for the purpose of reducing cost.

I do not see at all that it contributes to the permanence of the business and to its stability. It seems to me that the permanence and stability of our business depends upon
1754 our maintaining our position with our customers and in supplying our customers with the kind of products which they require at a reasonable price.

Keeping proper relations with employees, the matter of good health, the matter of keeping employees satisfied and efficient, and keeping them doing those things that they can best do, contribute greatly to the stability or permanence of the enterprise.

ALLAN B. CRUNDEN, recalled as a witness on
1755 behalf of the plaintiff, having been previously duly sworn, further testified as follows:

Direct Examination by Mr. Blackman.

March 22, 1932.

I am the same Allan B. Crunden who has testified
1756 previously in this case.

The chart showing the extent and employment of Bell System assets was prepared under my direction and supervision.

(Which said chart was marked for identification as Plaintiff's Exhibit A-99.).

The figures adjacent to the squares on this chart came, in the first instance, from the records of the Company, kept in the regular course of its business. For convenience, I have taken the figures showing the assets of the associated companies from the annual publication called "Bell Telephone Securities Manual," which was marked for identification by the defendants as their Deposition Exhibit 111. The Long Lines figures were obtained from the balance sheet of the Long Lines Department of the American Telephone and Telegraph Company, and the figures for the Bell Tele-
1757 phone Laboratories, Bell Telephone Securities Company and the Cuban-American Company were obtained from the balance sheets of the respective corporations as of the date of the chart (December 31, 1929). The same is true of the 195 and 205 Broadway Corporations. The figures for the Western Electric Company and its subsidiaries were taken from the annual reports of those companies, which have been made available to the defendants by Mr. Gregory's organization. The items represented by the black squares at the top of the chart were taken directly from the books of the American Company, and represent certain assets employed by that Company.

The defendants have had access to, or have been furnished

with all of the papers to which I have referred, with the possible exception of the annual report of the Cuban-American Company, which is one of the small items below the second horizontal line.

1758 The squares in the deeper blue represent the so-called associated operating companies, including the Long Lines Department of the American Company which is generally considered and referred to as one of the associated companies and which, along with the associated companies, receives the license contract service. The shaded or darker portion of the deeper blue squares represents the extent of the interest in the respective companies not owned by the American Telephone and Telegraph Company. In the Pacific System, for illustration, the assets corresponding to the proportionate ownership of the American Company are shown by the top portion of the blue square. The remainder is shown by that portion of the square below, which is ruled and somewhat darker.

The size of the squares are drawn roughly to scale and represents the total assets of the respective companies as shown by the assets side of the balance sheets of those

1759 companies. The Southern New England Company, to the extreme left of the sheet, shows that the American Company has a small ownership; the figures for this Company will be found on page 47 of the Bell Telephone Securities Manual to which I referred. The whole company receives the license contract service and not merely the part owned by the American Company.

The Long Lines Department is shown in darker blue, because it receives the license contract service.

The light blue squares (which include some of the companies below the first horizontal line) include the Western Electric Company and certain others, such as the 195 and 205 Broadway Corporations. They are companies engaged wholly or principally in furnishing services helpful to the associated companies.

There are three squares which are not colored. The largest is marked E. R. P. I. (Electrical Research Products, Inc.),

which is the company engaged in the business connected with the talking moving pictures and what is generally known
1760 as "by-products." Just below that there is a small square, also not colored, and entitled "Other Subsidiaries of the Western Electric Company," which relates to some small interest in securities, realty, and an industrial railroad used by the Western. That leaves only the black squares at the top of the chart, which represent assets employed directly by the American Company.

The chart, taken as a whole, shows that practically the entire property of the American Company, owned by it directly or indirectly, is represented by its interest in the twenty-odd associated companies and in facilities serving those companies.

(Chart marked for identification as Plaintiff's Exhibit A-99 offered and received in evidence.)

1761 The sheets marked for identification as Plaintiff's Exhibit A-100 were prepared under my direction and supervision. They are six sheets, representing a series of ratios obtained by comparing certain Long Lines factors (such as plant, service, employees, expenses, total plant, messages, etc.) with similar factors for the associated companies, including the Long Lines Department and the Bell Telephone Company of Canada.

These sheets correctly show at the bottom the source, or sources, from which the figures were obtained. In some cases similar figures appear on more than one chart, in which case I may have omitted the reference on one chart because it will appear on another. Each of the sources recorded on the sheets is a record kept by the American Company in the regular course of its business, with the exception of the
1762 figures pertaining to the Bell Telephone Company of Canada, which are taken from the records prepared by the Bell of Canada in the regular course of its business and transmitted to the American Company currently. The ratios developed on these sheets can be readily and easily checked by taking the figures from the annual reports of the American Telephone and Telegraph Company; the percentages developed

from the December 31st figures would be almost the same as those developed at the mid-point of the year. The figures on this exhibit represent the mid-point of the year so as to be average figures, and the annual reports give the figures at the end of the year; but it makes very, very little difference. If the figures for the end of the year were taken from the annual reports, as this is a ratio, there would be a corresponding change on each side.

The sheets marked Plaintiff's Exhibit A-101 for identification are ratios developed by comparing certain factors
1763 for the Chicago area of the Illinois Bell Telephone Company (such as stations, plant, expenses, etc.) with similar factors for the total associated operating companies, including the Bell of Canada, but excluding the Long Lines. The procedure in this case is similar to the one that I made on Exhibit A-100, and the references shown at the bottom of the pages correctly state the sources from which the figures came. Each of those sources was a record kept in the regular course of business by either the American Company or the Illinois Bell, with the same exception in the case of the Bell Telephone Company of Canada of which I spoke in connection with Exhibit A-100.

All of the records referred to by me have been avail-
1764 able to the defendants. I prepared these ratios at the request of Mr. Gherardi, and furnished them to him when they were prepared. I prepared the chart at the request of Mr. Blackman.

(Cross-examination reserved by agreement.)

B. GHERARDI, called as a witness on behalf of the
1765 plaintiff, having been first duly sworn, testified as follows:

Direct Examination by Mr. Blackman.

March 22, 1932.

My name is Bancroft Gherardi. I am Vice President and Chief Engineer of the American Telephone and Telegraph Company. I was appointed Chief Engineer of that company in June, 1919, and was elected Vice President about February, 1920. I have been connected with the American Telephone and Telegraph Company since the summer or fall of 1907.

After graduating from the Polytechnic Institute of Brooklyn with the degree of Bachelor of Science, I went to Cornell University and took the course in mechanical and elec-
1766 trical engineering. I was graduated from Cornell University with a degree of Mechanical Engineer in 1893. After graduation, I returned for a year's postgraduate work, and received the degree of Master of Mechanical Engineering in 1894.

I started in business in the Engineering Department of the New York Telephone Company, where I assisted others with various classes of work and did various classes of work myself. I became familiar with switchboards, cables, wires, pole lines, and other parts of the telephone plant of the New York Telephone Company. I became Local Fundamental Plan Engineer, and, as such, prepared a new fundamental plan for New York City, working with and receiving assistance from the engineers of the American Bell Telephone Company. In November, 1899, I became Traffic Engineer of the New York Telephone Company, reporting to the Traffic Superintendent, in which position I had charge of the work ordinarily known as traffic engineering.

1767 On January 1, 1901, I resigned from the New York Telephone Company to accept the post of Chief Engineer of the New York and New Jersey Telephone Company, which

was a sub-licensee of the New York Telephone Company, operating in all of Long Island, including Brooklyn, and all of northern New Jersey. In that position (which I held from January 1, 1901, until March 1, 1906), I was responsible for all the engineering work of that company. In March, 1906, the operating organizations of the New York Telephone Company and the New York and New Jersey Telephone Company were consolidated, and I became the Assistant Chief Engineer of both companies. In that position, I was responsible for the engineering work of both companies, subject to the general direction of the Chief Engineer. (For a period of the time of which I have spoken the corporate name of what is now the New York Telephone Company was the Metropolitan Telephone and Telegraph Company.) In the summer or fall of 1907, I resigned from the New York Telephone Company to accept a position in the Engineering Department of the American Telephone and Telegraph Company.

1768 The carrying out of the duties of those various positions gave me a general familiarity with all parts of the plants of those companies. It gave me a similar familiarity with their operating methods, especially as they concerned engineering. My experience up to the time I went with the American Telephone and Telegraph Company, in 1907, gave me familiarity with the entire plant and all of the properties (as far as they concerned or touched engineering), the telephone problems and solutions of those problems in the
1769 largest unit of the Bell System at that time. The problems of the various associated companies were, generally speaking, somewhat similar, and I became rather familiar with them. I had no special familiarity at that time with the problems of the Long Lines Department of the American Telephone and Telegraph Company.

At the present time, I am the head of the Department of Operation and Engineering of the American Telephone and Telegraph Company, sometimes called the O and E Department. My personal responsibilities are for the correct and proper administration of the department at all times and for seeing that the work is done in a satisfactory and helpful

manner. The work of the department consists of advising and assisting the associated companies of the Bell System, including the Long Lines, with reference to engineer-
1770 ing and operating problems. The operating problems are broadly covered by the work of the Traffic Department, which has to do with the handling of connections in the central offices and putting the connections through; the Plant Department, which has to do with the construction and maintenance of the plant; and the Commercial Department, which has to do with the sales, the business connections of the company, and all of the dealings with the subscribers. The duties of the O and E Department can be summed up by stating that it teaches the operating companies the best use of the methods and apparatus known to the telephone art.

There are somewhere between 700 and 750 people employed by the O and E Department, who are, generally speaking, operating and engineering men, with, of course, the
1771 necessary clerical assistance, such as stenographers, comptometer operators, and people of that kind.

The principal part of the work of my department does not consist of specific jobs for individual companies. It consists of the development of engineering methods; the methods of using Bell System standards; the devising of operating schemes and methods; the analysis of operating results; the making of comparisons between the results obtained in one place and in another; and then, as a result of all that work, the assisting and advising, either in a general way or specifically, if specific advice is needed, as to the conditions thus developed. Generally speaking, I would say the results of our work are applicable to all of the associated companies. The results of a portion of our work are not applicable to the Long Lines Department.

1772 The results of our studies are communicated to the various companies of the Bell System by bulletins, circular letters, specifications, drawings, drafts of operating instructions, and by conferences and interviews. Sometimes we have conferences at which representatives of the O and E Department and representatives of all the associated companies

and Long Lines come together at one place (which is very often outside of New York). Sometimes we visit the associated companies in the field, and sometimes their people visit us at headquarters.

A few examples of the solutions of telephone problems which our department has made and communicated to the operating companies, and the manner in which they have been communicated, are as follows:

Here are the notes on "Service Order Practice", which is one of our most important routines, controlling the operation having to do with the steps necessary to be taken from the time the prospective subscriber signs a contract for
1773 telephone service until that subscriber is connected up, and until the auditors have the proper information for billing him, the switchboard is properly marked, cross-connections have been properly run, and everything else has been done necessary to connect him. This routine was not issued at one time, but is a series of advices in regard to that routine, and is under a continuing state of development. I could not state just what the bulk of this booklet is, but it consists of several hundred pages and contains a number of drawings and tables.

The amount of time elapsing between the time the subscriber asks for service and the time he gets it varies with individual cases. For some time the Bell System has been putting in what is known as the Appointment Call Plan of Installation. Under that plan, a subscriber is asked when he would like to have his telephone installed, and, generally speaking, we are able to install the telephone at that time. If he wishes it done the next day, it is done the next day, or if he wishes it done a week from the date of the appli-
1774 cation, it is done a week from that date, and if, in an emergency, he wishes it done in an hour, it is done in an hour. I have not studied this problem from the point of view of just how many things have to be done between the time the subscriber signs the contract and the time he gets the service in order to have him properly recorded and hooked up,

and all the necessary accounting and engineering done, but I would suppose there would be fifty things to be done.

Another of the examples of the instructions communicated to the operating companies is "Local Operating Practice, Manual Offices." This is similar to the other one, and consists of several hundred pages. Parts of it are issued from time to time, as there is a continuous development of the subject. It describes in detail the methods used in handling telephone calls in local manual offices and the detailed methods of handling the various troubles when any irregularities happen in the handling of calls. While it instructs the various companies in the manner in which we think is the best way to
1775 meet these problems, it really goes further than that;
it is put in the form of instructions, which are used directly in teaching the operators. Formerly we got out our instructions in more generalized form, requiring further work by the associate companies in order to apply such matters to the direct training of their people. At the suggestion of the associate companies, we modified our method of work so as to put our matter in such form that, if considered satisfactory by them, it might be directly used in the training of their people.

During the course of the year we send out several thousand circular letters, bulletins, drawings, and advices of one kind or another to all of the associate companies, including the Long Lines. In some cases, these booklets are sent out in great numbers; we have had editions of booklets, which, at the request of the associate companies, have run into tens of thousands.

My department has to do with the method of handling
1776 telephone calls. In round figures, I should say twenty
to twenty-five billion calls are handled annually by the companies of the Bell System. Something on the order of $5,000,000 would be saved to the local companies of the Bell System from a reduction of one second in the time required for the A operator to handle a local call. During the period 1923 to date, new methods of handling calls have been developed by our department and recommended to the associate

companies, which have had the effect of improving the service and lessening the cost of giving the service, as contrasted with what it would have been had the new methods not been developed and used.

1777 The series of sheets marked for identification as Plaintiff's Exhibit A-102 is what is known as the Organization Diagram of the O and E Department as of April 1, 1930. It is prepared for the purpose of advising all those who work with the O and E Department (that is, the other departments of the American Company, the associate companies, and the Long Lines) as to the division of our work, who handles various classes of work, and who is responsible for the various classes of work in the department. In an organization the size of the Bell System, a great deal of time and motion would be lost if a man did not know whom to go to, to get advice on a particular problem. This diagram is prepared by the Office Manager of the O and E Department, in accordance with instructions requiring its preparation twice a year; it is issued as of April 1 and October 1. Copies are distributed within the

1778 department itself, to the other departments of the American Telephone and Telegraph Company, and to the departments with which we work in the associate companies and in the Long Lines. It has been the custom to make up these diagrams and distribute them, certainly since I have been Chief Engineer (1919), and they have been in general use throughout that period and correctly show the kinds and classes of work which each separate group is engaged upon.

The expenditures for the O and E Department for the year 1930 amounted to about $4,500,000. These expenditures have been increasing substantially over the period from 1923 to 1930. There is a monthly record kept of the payroll expen-

1779 ditures and each of the other expenditures which go to make up the total expenditures of the department. Our payroll expense is about three-fourths of the total expenditures of the department. The remaining expenditures are rent, traveling, printing, postage and stationery, telephone and telegraph service, and similar items. This expense is

divided between the large subdivisions shown on Chart 1
1780 of Exhibit A-102; that is, to the Plant Operation Engineer, the Traffic Engineer, the General Operating Results Engineer, the Office Manager, the Plant Engineer, the Commercial Engineer and to the general administration item consisting of Mr. Waterson (the Assistant Vice President) and myself, and our respective secretaries.

We do not keep, and have not kept since I have been Chief Engineer, any record showing the time spent, or cost incurred in doing any separate particular piece of work. We do not do that because such a record would not be useful in the administration of the department and would be exceedingly costly to make. So much of our work is rather general in character and applies to all, that such a record would be an allocation rather than a definite assignment of the different parts of the work on the basis of facts. Most of the
1781 work is not done at one time for one company and at another time for another company, but nearly every piece of work has a common application to a great many, if not all, of the units of the Bell System.

I am familiar with the extent to which the work of our department applies to the business and properties of the several units of the Bell System, and with the extent to which it is availed of by them. With my knowledge of the work done by my department and of the use thereof made by the several operating units of the Bell System, I can prorate the expense thereof between the associate companies and the Long Lines Department of the American Telephone and Telegraph Company on the basis of the use which is made of the work that we do. I have made such an apportionment, which is shown on the paper marked for identification as Plaintiff's Exhibit A-103.

1782 In this allocation, I have undertaken to deal with every year from 1923 to 1930, inclusive. The problem is to divide the expenses of the O and E Department which are incurred in rendering the license services between the associated companies and the Long Lines according to their use of the services. Some of our work (and the use made of it)

has to do primarily with the item of plant investment; it has to do with the plant which is in service in the associate companies or in the Long Lines. Another part of our work has to do peculiarly with the employees and the questions concerning employees. Still another portion has to do with items very directly reflected in the expenses of the Long Lines and associated companies. From my knowledge of the work, I have chosen these three items and the ratio of these three items of the Long Lines to the associate companies as a basis of allocation. As will be seen in the last line of the 1783 statement for 1930, the Long Lines plant investment was 9 per cent of the total investment of the Long Lines and associate companies, including Canada; in 1923, it was 6 per cent. The Long Lines employees in 1930 were 6.2 per cent of the total employees, and the expenses of the Long Lines for 1930 were 7.6 per cent of the expenses of this total group. I have composited these figures and arrive at a composite index of 7.6 per cent for the year 1930, and, by means of this figure, I have allocated $329,883 to the Long Lines and the remainder, $4,110,685, is to be divided between the associate companies, including the Bell Telephone Company of Canada, but excluding the Long Lines.

The detailed ratios shown in columns 2, 3 and 4, I have 1784 obtained from Mr. Crunden. The figure in column 5 is a composite of the figures in columns 2, 3 and 4 and was developed by me. The figures in column 6 were taken from the records of the Engineering Department and represent the expenses of my department.

In my opinion, the method followed in preparing this exhibit gives a fair and reasonable apportionment of the expenses of my department between the Long Lines and associate companies on the basis of use, assuming the correctness of the figures furnished to me by Mr. Crunden.

I have made another apportionment with a different 1785 approach. This organization chart is for the same date as the previous one, but has been enlarged photostatically for more convenient reference. It is in all respects identical with the chart which has been marked A-102, except

for certain additions which have been made in connection with my allocation. These additions, as will be shown on Chart 2, are certain rectangles in various colors, together with a key to the colors in the corner of the chart.

I know the classes of work that the people shown on this chart are and were doing; I could not tell as to each individual man, but I am familiar with the nature of the work of the groups and sub-groups.

1786 There are some sections of the department shown on the organization diagram (which is marked with various colors) whose work was confined solely to problems connected with the operation of the associated companies and had nothing to do with the toll plant or toll services of the Long Lines Department. There was no group nor individual in the department engaged upon work which related solely to the Long Lines. The groups having nothing to do with the Long Lines are those enclosed in blue rectangles. On the various sheets there is a total representative organization diagram for April 1st. The first group at the top of Chart 2 is a typical one; that is the local traffic engineering section. That section deals with problems concerning the handling of local traffic, and does not deal with the problems concerning the handling of toll traffic. Of course, the Long Lines has no local traffic and no local traffic problems and it makes
1787 no use of the work of that group. I have gone through the various sheets of the chart and enclosed in blue rectangles all the people whose work I knew had nothing to do with the Long Lines.

The largest interest of the Long Lines is in the groups enclosed in red rectangles, which are those groups whose attention is given to problems concerning the handling of toll traffic and whose problems do not relate to local traffic. The second group on Chart 2 is an illustration of that type of group. I have gone through the chart and enclosed in red rectangles all of the people engaged in that class of work. That class of work is not confined to the Long Lines, but is common to the toll business of the Bell System. By
1788 "toll business," I include all of the toll business of the

associate companies and all of the Long Lines toll business.

For the year 1930, I have enclosed in blue 32½ per cent of the people, as doing nothing for the Long Lines; this constitutes 33 per cent of the total salaries of all of the people allocated in any one of the three colored rectangles.

For the year 1930, 15.8 per cent of the people in the department are enclosed in red rectangles, and this represents
1789 15.1 per cent of the salaries of all the people enclosed in the rectangles.

Those engineers shown in the yellow rectangles are engaged in work which is neither local nor toll, but is of such character that it has to do with both local and toll plant, traffic, or engineering; they constitute 51.7 per cent of the total. For an illustration of the character of the work performed by these people, I will take the Traffic Results Engineer, shown near the bottom of Chart 2. One substantial group of people under him are engaged on employment practices, which have to do with wages, working conditions, vacations, holidays, time off, and many other problems of that kind which are common to all of the operating units of the Bell System.

1790 I have analyzed the work of the second class of people to whom I referred (those enclosed in the red rectangles), in order to see to what extent they were dealing with problems affecting Long Lines and to what extent with problems affecting the associate companies. I am able to allocate the expenses of the groups of our operating and engineering forces enclosed in such red rectangles between the Long Lines and the associate companies on the basis of the use made by those companies of that work. This group has to do solely with toll work. They are not engaged in local work, and I have, therefore, selected certain indices to compare the toll work done by the Long Lines Department with the amount of toll work of the associate companies. These indices are toll plant investment, toll board messages, total toll
1791 messages, and toll employees. For the year 1930, the toll plant investment of the Long Lines is 37 per cent of the toll plant investment of the Bell System, as shown by

the books. The toll board messages are 14 per cent, the total toll messages 5.1 per cent, and the toll employees are 21 per cent.

Having obtained those ratios, in order to obtain an allocation I composited them into a single figure, which, for the year 1930, was 19.3 per cent. In my opinion, the application of that percentage to the expenses of the people enclosed in red fairly allocates their expenses as between Long Lines and associate companies on the basis of use.

That leaves the yellow-enclosed people, who constitute 51.9 per cent of the total group. They are working on problems common to both toll and exchange. I have analyzed the work of that group and am able to allocate the cost of that work between Long Lines and the associate companies on the same general theory that I did the rest.

1792 In this case, as a basis for my final ratio I used plant investment (that is, the total plant investment, both local and toll), relative number of employees, local and toll, and total expenses; from these three figures I have made a composite figure. For 1930, the Long Lines plant investment was 9 per cent of the total Bell System investment; employees were 6.2 per cent of the total employees of the System, including Bell of Canada in all cases; and the expenses of the Long Lines were 7.6 per cent of the total expenses. These composited to 7.6 per cent. In my opinion, that fairly prorates or allocates the expenses of those people shown in yellow between the Long Lines and the associate companies.

1793 Having dealt with the three separate classes, I will illustrate how I arrived at my total allocation by telling what was done for the year 1930 as to the allocation made by people. 32¼ per cent of the people were engaged on work for which there was no Long Lines use (those are the ones enclosed in blue); none of those people were allocated to the Long Lines. The next was the toll group, enclosed in red, which constituted 15.8 per cent of the people enclosed within any of the rectangles, and I applied the composite percentage of 19.3 per cent to the 15.8 per cent, making 3 per cent of the total department to be allocated to the Long Lines. I next

took the 51.7 per cent of the people who were engaged on both local and toll work, and, by the use of my composite, I found 3.9 per cent of the total department should be allocated to Long Lines. This, added to the 3 per cent found before, gives 6.9 per cent as the total allocation (by people) to the Long Lines.

There are in the organization sheets certain people not enclosed in lines. They are in the Clerical Department 1794 (under the Office Manager), the heads of the divisions, the Assistant Vice President (Mr. Waterson), and myself. They are overhead and clerical assistants, and I allocated them in proportion to the allocation of the other people. These clerical forces are called upon from time to time by each of the various groups of engineers which I have allocated, and I merely prorated them on the same basis as I prorated the engineers who call upon them for assistance. In my opinion, this is a fair and reasonable way in which to allocate that work.

The top line engineers generally supervise and direct the work of the people under them and are responsible for the results obtained by that whole group. I have prorated each of them on the basis of the work which he was doing 1795 with respect to the people under him. In my opinion, that is a fair way to prorate that part of the expenses of my department.

I have made a similar allocation for the year 1923. The second part of Exhibit A-104 is the organization diagram of the O and E Department as of April 1, 1923. I have examined and analyzed that organization diagram to determine what part, if any, of the forces shown thereon works solely on 1796 problems affecting the local companies, and what part works solely on toll problems, and what part works on both toll and local problems. I proceeded in the same way in regard to this 1923 chart as I did in regard to the 1930 diagram, which I have just explained. In the allocation of people for the year 1923, I found that the percentage of people on work of which the Long Lines made no use (those enclosed in blue rectangles) was 44.2 per cent of the total people. The

people in the group engaged on toll work only, of which the Long Lines makes relatively more use, was 12.1 per cent. The percentage of the people engaged in work which has application to both local and toll (those enclosed in the yellow lines) was 43.7 per cent of the total people enclosed in the rectangles.

The people enclosed in the blue are those who are engaged on work of which no use is made by the Long Lines.

1797 I have allocated no part of that group to the Long Lines Department. The people enclosed in red are those engaged in working on toll, but not on local problems; these I allocated according to certain ratios, arrived at in the same way as I arrived at the ratios for 1930, that is to say, the figures for toll plant investment, toll board messages, total toll messages, and toll employees; the figures, of course, are different, because the figures are for the facts of 1923. The ratios are corresponding ratios for the facts as they were in 1923. With regard to those working jointly on local and toll problems, I took the same four ratios with the facts as of 1923 (that is, the ratio of plant investment, employees and expenses), and arrived at a composite ratio as I did in the case of the year 1930.

4.1 per cent of the department in the year 1923 is
1798 allocated to the Long Lines on the basis of the number of people. We got a lower figure for 1923 than we did for 1930, because there was relatively less toll work being done in the department in 1923 than there was in 1930, and because the Long Lines was relatively a smaller proportion of the total system in 1923 than it was in 1930. It has grown relatively faster than the local business.

For both 1923 and 1930 I took the salaries which the people received and compared those salaries with the total salaries of the groups treated, and determined the percentages on the basis of pay.

The document identified as Plaintiff's Exhibit A-105 shows the allocation of the O and E Department expenses to the Long Lines on the one hand and to the associate companies (including the Bell Telephone of Canada) on the other hand, on the basis of salaries for the years 1923 and 1930. It also

shows an allocation on the basis of numbers of people
1799 for every year from 1923 to 1930, inclusive. So two years are allocated by both methods and the intervening years are allocated by using the numbers of people only.

This exhibit (A-105) is divided into two tables. The first column in the top table shows the years 1923 and 1930. The second column shows the percentage of our salary expense for the group of people enclosed in blue, that is, where there is no Long Lines use; these figures were developed in the manner I have already described, and on the basis of the salaries of the people in the different groups. The third column gives the percentages of the salary expense of the people enclosed in red rectangles. In the next column,
1800 the zeros indicate that there is no portion of the salaries of this group allocated to Long Lines, because there is no Long Lines usage in the group. The fourth column gives the percentages of the salary expense of those people enclosed in red rectangles, and the fifth, sixth, seventh and eighth columns give indices used in the allocation and are, respectively, the toll plant investment, the toll board messages, the total toll messages and the toll employees; these are the ratios that I have already described. The ninth column is the composite of columns five, six, seven and eight, and is obtained by taking an arithmetical mean of the figures in those columns. The figures in the tenth column are the result of multiplying the percentage of the employees in the group by the composite percentage arrived at in column nine, and is the per cent of the total expense that is applicable to Long Lines because of the work of the people enclosed in red.

1801 The next group deals with the people who are engaged in work that has to do with both exchange and toll. In the first column under that subdivision is given the per cent of the salary expense of this group to the total salary expense of all those enclosed in any one of the three colored rectangles. The next three columns give the ratios which I have used and which I have already explained. The next column gives the composite of those three ratios, which is an arithmetical mean. The next column shows the percentage

of the total department chargeable against Long Lines for those people who are in this group.

The last column shows the sum of the allocations of the red and yellow people, and is 4.2 for the year 1923 and 6.8 for the year 1930.

1802 In the lower chart for the years 1923 and 1930, I have done exactly the same thing that I have already described for salaries, except that the allocation in this lower chart has been made on the basis of the number of people enclosed in rectangles instead of on the basis of the salaries paid those people. For the years 1924 to 1929, inclu-
1803 sive, I have done exactly the same thing as to the allocation by numbers of people. That is, I have taken the organization chart for each of those years and marked the people off in blue, red and yellow, as I have already described, and then determined, by the kinds of ratios I have referred to, the allocation of each of these groups. I have not done that on the basis of the pay of those people for the years 1924 to 1929, inclusive. That would be an exceedingly burdensome computation; it involves going back to the payroll records, and for each diagram dealt with, taking many hundred individual entries. I did it both on the basis of the salaries and on the basis of people for the years 1923 and 1930 and found the results were almost identical, and, therefore, I did not go through the exceedingly laborious
1804 computations involved in doing that for each of the intermediate years. For instance, the second column shows that percentage for the year 1923 was 43.5 per cent on the basis of allocation by salaries, and 44.2 per cent on the basis of allocation by people, and the last column shows that the total allocations to Long Lines were 4.2 per cent on the money basis and 4.1 per cent on the basis of the number of people. For 1930, the allocations were 6.8 per cent on the basis of money and 6.9 per cent on the basis of the number of people. In my opinion, the reason for that close agreement was that, generally speaking, the salaries will average out and give the same result as the numbers of people; while they are men of somewhat different detailed experience, they

are men of the same general period of experience, the same kind of engineers, the same kind of operating men, and all getting about the same salaries. We make no difference in the pay of the people who are working on toll from the pay of the people who are working on local problems. This
1805 was true throughout the whole period from 1923 to 1930.

I developed the people ratio and, based on the facts developed in 1923 and 1930, assumed that the money ratio would be the same, or so nearly similar that it would produce no significant difference. So I have prorated the money on the basis and on the several bases shown on the table at the bottom of Exhibit A-105.

In my opinion, the figures developed in the last column to the right on Exhibit A-105 fairly set forth the full percentages of the entire expense of my department which should be allocated to the Long Lines Department in each of the years 1923 to 1930, inclusive, upon the basis of the use made of the work of that department for which those expenses were incurred.

1806 It seems to me that there is little or no opportunity for difference in judgment or opinion concerning the allocation of the people (or their expenses) shown enclosed in the blue rectangles on the 1923 organization chart. That, I should say, was a question of fact. I know of my own knowledge the classes of work done by those people, and I know that it has no relation to the plant, people, or problems
1807 of the Long Lines, although there is a microscopical and exceedingly minute part of such work that might be questioned; a part so small that it could not be allocated. I have in mind this: the Long Lines has a test station,
1808 and from that test station is run a pair of wires to the desk of the manager in charge of that station, on the end of which is an ordinary telephone instrument. It might be argued that that is a local line. There are, perhaps, a few hundred or a few thousand of such cases in the Long Lines, as compared to fifteen million regular stations in the Bell System. It might be argued that one one-hundredth

or one one-thousandth of one per cent of this group should be charged to the Long Lines. I merely mention that in the interests of technical accuracy, but I believe that my first statement, that there is no opportunity for difference of judgment or difference of opinion as to the people enclosed in the blue rectangles, is, as a practical matter, entirely accurate.

1809 I do not think that any reasonable treatment of those people enclosed in the red rectangles could make a substantial change in the allocation which we are discussing. They are a relatively small portion of the total of the department, and the character of the Long Lines business and the Long Lines work is so related to the character of the associate companies toll business and the associate companies work that I do not feel there is opportunity for a question that would substantially modify the total allocation made. The people in this group constituted 12.1 per cent of the total in 1923 (which was the lowest percentage in this period) and increased to 15.8 per cent of the total in 1930. There is

1810 no room for doubt as to the figure of 12.1 per cent for the year 1923; that is definite, because I counted the people and I knew what they were doing.

I have applied to that percentage of people a ratio, which, if increased by 10 per cent thereof, might change the final figure of 4.1 to 4.2 per cent or 4.3 per cent; that would be the maximum effect of that change. I cannot conceive of the use of any reasonable factors in addition to those that I have used, or in place of those that I have used, that would make a variation in the allocation figure of as much as 10 per cent.

1811 There would be very small room for change in the group of people enclosed in the yellow rectangles and the expenses represented by them. That is overall work and there is nothing peculiar at all about it. It is work that applies both to toll and local plant, to toll and local people, to toll and local expenses, and to toll and local whatever the problem may be. There is so much more local plant, so many more local people, and so much more local expenses, that obviously the percentage applicable to toll is relatively small; and

then the Long Lines is by no means all of the toll. I got a composite figure for this group of 5.1 per cent for 1923.

The highest ratio used in arriving at that composite for
1812 1923 was 6 per cent, representing plant investment. I know of no higher ratio for which there would be any logical support for use in developing the composite. If, instead of using the several ratios that were lower than 6 per cent, I had used the 6 per cent alone, the effect on the final figure might have been to raise it from 4.1 per cent to 4.2 per cent.

If I were questioned concerning the similar allocation for 1930, my answers would differ only as to the detailed figures appropriate to that particular year. There would, in each case, be a similar definite limit of the extent of possible error; by "possible error", I mean, of course, reasonable error.

In addition to the methods which I have already explained,
I made a still further allocation upon a third basis,
1813 which is shown on the papers marked Plaintiff's Exhibit A-106 for identification. In this allocation, I took each group in the department organization (and sub-groups within that group if they were engaged in work which should be differently allocated), and so finally divided the people who can be allocated at all (the same people I have already been talking about in allocating) into a large number of small groups, and gave specific consideration to each small group. Sometimes I have broken down to the last unit and the last man. By that method, I developed, I think, 55 separate groups,
and, as this was an allocation on the basis of sal-
1814 aries, obtained the salaries paid to the people in each of these small units. We allocated the people above the separate groups according to the composite ratio of the group itself, and disfributed the clerical and overhead expenses between these different groups.

In effect, I did 55 times as much allocation as I did in connection with my first allocation, and made 55 allocations instead of the 3 allocations that I made in the second method.

1815 For the purposes of illustrating this third method of

allocation, I will take Chart 2, for April 1, 1930. The second section of this chart shows the Toll Traffic Engineer. Some part of his work applies to all classes of toll traffic, and there I have used as a ratio the total toll messages, because the work applies to all toll traffic. Certain other portions of his work apply to toll boards only, and for that I have used the ratio of Long Lines toll messages to total toll messages. Another illustration is on Chart 5 for April 1, 1930. Here the first section shown is the Station Engineer and his group of people. They deal solely with subscribers' sub-station equipment, and for that I have taken a zero allocation to Long Lines. The next group of three men deals with building plans, and for that group I have taken 2 per cent, which
1816 is the ratio of the building investment of the Long Lines to the total building investment of the Bell System (including the Bell Telephone of Canada).

What I have done in this Exhibit A-106 may be summarized by saying that I have applied to each of the 55 or more groups the ratios which, in my opinion, are applicable to determine the prorating of the work of that particular group between the Long Lines and the associate companies on the basis of the use of that particular work.

The money figures, the ratios, and all other matters necessary to understand my method of procedure in connection with this allocation are shown on Exhibit A-106, unless it is desired to see the detailed computation.

I have used a great many more ratios than those that have already been referred to. Some of these ratios I got from Mr. Crumden and a few I made for myself. The ratios which I got from Mr. Crumden are easily identified by com-
1817 paring his sheets with those that I used.

On Chart 5 as of April 1, 1930, is shown, at the lower right-hand corner of the chart, Note 1. That Note 1 comes down from a small section near the middle of the page, and is a group of people whose work is entitled on the organization diagram "High Frequency Systems". Those people are dealing with four classes of work; they are dealing with carrier

systems, and the Long Lines has 60 per cent of the channel mileage of the carrier systems in the Bell System; they are dealing with program transmission circuits, and the Long Lines has 40 per cent of such circuits; they do some work in connection with radio systems, and, during the year 1930, the radio systems existing and being engineered were three-fourths Long Lines and one-fourth associate companies; they deal with public address systems, and public address system service is rendered entirely to associate companies. I have composited those activities on the basis of 50 per cent to the Long Lines. In that particular group, Long Lines is
1818 getting an allocation of 50 per cent against a general allocation in the end of about 6 per cent.

Each of the ratios that I used that is not contained on the sheets Mr. Crunden furnished me was one that I developed myself from the records or information that we had in my department. These records or information were obtained in the regular course of business and we are dealing with them continually.

I made a similar detailed allocation of the people shown on the chart for the year 1923, as well as 1930. I made that allocation in the same way.

1819 I have prepared a table which shows by each of the three methods which I have described the percentage of the expenses remaining to be allocated between the Chicago area of the Illinois Bell and the remaining areas of all the associate companies. That is the sheet identified as Plaintiff's Exhibit A-107. It shows the percentage remaining after deducting from the total 100 per cent the allocation made to the Long Lines in the three allocations which I have described, and it shows that the three methods give very closely comparable results. This close agreement between the results obtained by the three methods indicates to me the validity of the methods used. In the first place, I made a general allocation on the basis of general use; I then broke the
1820 people down into different classes of work (of toll, of local, and of local and toll jointly), and applied ratios to them; I then broke it down into 55 different groups

and chose appropriate ratios for each of them. By these three methods, I obtained substantially similar results.

The separations and allocations which I have described heretofore are directed toward allocating to the Long Lines Department a fair share of the total expenses of the O and E Department. I first eliminated the expense properly prorated to the Long Lines before prorating the expenses of the O and E Department between the Chicago area of the Illinois Bell and the remaining areas of the associate companies, because the Long Lines being exclusively a toll operating company made certain ratios and methods appropriate to that allocation which were not available for the other allocations. There were also certain items which can be used in making allocations between the various associate companies that were not available in the case of the Long Lines. When I said "not available", I meant they were non-existent. For instance, an important element in allocating between va-
1821 rious associated companies might be stations, or that might be considered as a significant item, but no allocation between associate companies and Long Lines can be made on the basis of stations, because the Long Lines have no stations.

After having made the allocation of expenses between the Long Lines and the associate companies and having taken out what I developed as the fair share to be allocated to the Long Lines Department, I made an allocation of the expenses remaining between the Chicago area of the Illinois Bell and the remaining areas of all the associate companies. The paper identified as Plaintiff's Exhibit A-108 is the sheet on which I have developed that allocation. In making
1822 that allocation, I have taken for each year from 1923 to 1930, inclusive, certain ratios as between the various associate companies as a whole and the Chicago area which are significant and have important relations to the work which we are doing and to the use of such work. The ratios which I have taken are stations, plant investment, employees and expenses. These I have composited by taking their arithmetical mean and so arrived at a single percentage for each

year, which I have applied to the total expenses of the O and E Department in the license services to the associate companies (including the Bell Telephone of Canada), but after deducting the allocation to the Long Lines. By that process, I arrived at the last column on the table, which shows the expenses of the O and E Department which I have allocated to the Chicago area. I have done that for each of the years 1923 to 1930, inclusive.

1823 There might be one or two very minor groups in the Department engaged upon problems which do not have any application to the Chicago area of the Illinois Bell Telephone Company, but, broadly speaking, every group in the Department is engaged upon problems having an application to the Chicago area of the Illinois Bell.

In my opinion, the use of the percentages shown on Exhibit A-108 as I have used them will result in allocating to the Chicago area of the Illinois Bell Telephone Company no more than its fair share of the expenses of my department for 1930, on the basis of the proportionate use by that area of the total work performed by my department for which such expenses were incurred. The same is true with regard to each of the other years 1923 to 1929, inclusive.

I have not dealt with 1931, as I did not have the complete figures.

For separating out the Long Lines I selected the general ratio, that is the one I first presented in my testimony. I selected that because I had to select either the first or the

1824 second, because the third one is only done for two years and was done as a check to see whether carrying the question down into the most minute detail would result in any substantial change in the allocations. As a matter of fact, the differences are relatively minor between the two allocations which were available for each of the years in question, and, generally speaking, the first allocation allocated more to the Long Lines and left less to the associate companies than did the second allocation.

1825 (Plaintiff offered in evidence exhibits marked for identification as Plaintiff's Exhibits A-102 to A-108,

both inclusive. Objections were reserved by the defendants until after the cross-examination.)

(Plaintiff offered in evidence exhibits marked for identification as Plaintiff's Exhibits A 99 to A 101, both inclusive. Objections were reserved until after the cross-examination of Mr. Crunden.)

1827 *Cross Examination by Mr. Haight.*

March 23, 1932.

In the compilation of Plaintiff's Exhibits A 102 to
1828 A 108, inclusive, I first determined personally the methods and co efficients which were to be used; I then determined the methods of computation which were to be used, and had the computations and the detail work done by the people in my department under my direction. I do not know the total number of people engaged on this work, but, including the clerical forces, I presume that at one time or another there were perhaps eight or ten people. The work was started last November and was finished just a few days ago,
1829 because just as soon as I saw that I was not going to testify last November, I turned to other matters.

In some cases, it would require turning to the original records to check these exhibits. I should not say, however, that it would require a force the same size as that employed in compiling them, to check them. To determine the correctness of each of the factors used and of each of the co-efficients used, and to examine the methods and to determine the correctness of the data from the original entries, would require considerable time. I should say that a couple of men
1830 in a day could do what I would call a spot check; but if every item and every computation is to be checked, and the principal work would be in checking the original data, it would require considerably more time than that.

The original records from which the data for these exhibits were taken are in New York. I do not remember any case

where summaries were used in the compilation of these exhibits instead of original data, and I do not think there are any such cases.

The Exhibits A 102 to A 108 were not used in the Ohio Telephone Rate Case.

I have preserved the working papers employed in the compilation of these exhibits. Those working papers are
1831 in the court room, and are available for inspection by the defendants if they wish to do so.

(Counsel for plaintiff agreed that these documents would be retained for inspection by the defendants after the close of Mr. Gherardi's testimony.)

In my testimony and in the exhibits, the references in certain instances to long distance property or investment refer to the investment shown on the books of the Long Lines Department.

1832 Occasionally, in connection with manual equipment, there may be direct trunks from the private branch exchange of the subscribers to the toll board, but that is not the normal arrangement in connection with giving telephone service. I could not say whether there are any such arrangements in Chicago or not. There may be toll terminals at which the subscribers' lines go directly to the toll board in connection with dial equipment in Chicago, and also in connection with dial equipment in Chicago there may be direct
1833 trunks from private branch exchanges to the toll board, but I do not know definitely. With reference to dial equipment, I do not know of any direct lines to the toll board in Chicago that cut out the toll office operator so the subscriber in that way directly uses the long distance service.

Some of these situations at least exist in some places in the Bell System.

The toll engineers of the Department of Operation and Engineering get their information with respect to the methods, conditions, operations and facilities of the local plant largely from contacts with the field people in the various companies. In some cases, they get that information from their general and prior experience, and, in some cases, from other people

in the department. Our department is so organized that those engineers can get information from the other engineers who pay more particular attention to the local exchange plant and its problems; they can also get information
1834 from the circular letters, specifications and drawings which are prepared by the local engineers.

From an engineering and operating standpoint, the problems of design, maintenance and operation of the local exchange plant are, in many respects, similar to those in the toll plants, and, in some respects, they are different. The local problem of interconnecting subscribers consists of the connecting together of subscribers with a single switchboard, or with a relatively small number of switchboards (depending upon the size of the city, the switchboards may run to 30, 40, 50 or 100), and is one of handling very large numbers of calls between those switchboards. The toll switching
1835 problem, on the other hand, is one of handling a relatively very much smaller number of calls, scattered over very much larger areas and with a very much smaller number of calls to any given destination. There are also differences in equipment which make the problems different.

"Q. Speaking of your Department of Operation and Engineering, is it true that it furnishes the licensee companies advice and assistance in connection with general construction problems, and co-ordinates those programs and the manufacturing facilities of the Western Electric Company?"

No, sir. That is not my understanding of what we are doing.

1836 We occasionally do a little work which might be characterized as co-ordination of the programs of the various associated companies in the Bell System with the manufacturing facilities of the Western Electric Company. To illustrate that, there are times when the associated companies, due to very rapid growth, are greatly in need of certain types of apparatus, or cable, or some other piece of property, so that it is not possible at the particular time for all the associated companies to get just what each one of them would like to have. We undertake to assist the associated

companies in that matter, so that each will get what it wants when it needs it as near as possible.

1837 My department gives advice in connection with provisional estimates in the Bell System. We have made suggestions to the various associate companies as to the most convenient method of approaching the estimate of their departmental expense. In many cases, we have also given suggestions as to the methods of preparing a construction program, so as to short-cut much of the detail work that is sometimes done in connection with such planning ahead of construction. Sometimes in connection with that we have sent out advices by way of letters, in the same general manner that I illustrated in connection with some other features on my direct testimony. Broadly speaking, we give our advice and assistance in much the same manner that we do in the things I illustrated on direct.

1838 After the provisional estimates come from the various licensee companies in the System, we look over each estimate, study the construction program and the departmental expenses provided in the estimate, and if, in any respect, it seems to us that a better or different provision of plant or expenditure of more or less money is desirable, we so advise the associate companies. The provisional estimates are available in our department for any one of the responsible people in our department who may find them of assistance in their work.

1839 *Re-direct Examination by Mr. Blackman.*

The choice of the ratios which I used in my allocation (that is, the three ratios on the general basis that I applied to the blue, red and yellow, including the allocation both on the expense basis and on the basis of the number of people, and the ratios in the 55 different classes treated by me in my detailed allocation) came from my judgment. The figures themselves came from records. The figures, with the exception of two or three, were furnished to me by Mr. Crunden, and appear in his exhibits. The money expended

in my department came from the official records of the
1840 department. With one exception, a general examination of this matter, outside of an examination into my judgment, would take a very short time; that one exception would be where individual salaries were used as a basis of allocation, in which cases it would be necessary to go to the original payroll records of each individual in order to check the work, and that is the most laborious feature in the whole allocation. That was the feature, however, that I found agreed most exactly with the allocation on the basis of people. A check of the allocation on the basis of people could be done in a very few hours.

Some of the similarities between Long Lines operation and the operation of the associate companies are: both, in many cases, employ operators; they employ wires and switch-
1841 boards; they employ linemen and use poles, lead covered cable and copper wire. The similarities are very numerous. The method of employing employees, for instance, is the same, as is the method of training them, except as to the exact detail of what they are taught; the general methods, however, are the same. The extent of training is the same, and the pay is the same in the same place. That is, in Chicago the people who are handling the Long Lines business get the same pay as the people who are handling the local business; they get the same pay when they are employed, and their schedule of progression is at the same rate.
1842 The people who are maintaining the plant are maintaining the same general kind of plant with, naturally, some variations, because the plant is not identical, although it has many similar elements. There is no difference between the Long Lines' pole lines and the pole lines of the associate companies. So far as lead covered aerial cable is concerned, the conductors are not necessarily identical, but the cable itself is the same general cable, and the sheath maintenance is the same. The underground cables of the local companies sometimes run in vitrified clay ducts (that is the general type), and sometimes in other types of ducts. The Long Lines

underground cables run in the same kinds of ducts. The
1843 general maintenance of that class of plant is the same.

The switchboards that handle the long distance calls of the Long Lines are not identical with the switchboards that handle the toll calls of the associate companies, but they consist of many of the same elements, and, generally, are a similar class of apparatus. The toll switchboards are similar in many respects to the local manual switchboards; that is, they consist of jacks, relays, plugs and cords.

(Plaintiff reoffered in evidence Plaintiff's Exhibits
1844 A-102 to A-108, inclusive, which were admitted.)

ALLAN B. CRUNDEN, recalled as a witness on behalf
1845 of the plaintiff, having been previously duly sworn, further testified as follows:

Cross-Examination by Mr. Goldstein.

March 23, 1932.

The Bell Telephone Securities Manual procured the information shown on Exhibit A 99 from records in the possession of the American Telephone and Telegraph Company.
1846 Those records are copies of the annual reports of the various companies referred to in the exhibits, and reports coming to the American Telephone and Telegraph Company in the ordinary course of business. Those latter reports are what are known as the M. R. reports (Monthly Reports). Both the M. R. reports and the reports to the stockholders of the respective companies would show the same figures. The M. R. reports are sent in to the American Telephone and Telegraph Company in the regular course of business.
1847 I was present a part of the time in the assembly room at the time of the taking of the depositions in New York; I was in and out. I may have been present when a request was made for the M. R. reports to be produced, but I do not recall at this time. I do know that they were refused to the defendants. I am talking of the reports of the individual

companies. M. R. Report No. 2, in particular, shows the assets, liabilities, and income statements of the individual companies.

1848 I compiled the figures shown on Exhibit A-100 about a month ago. The figures on this exhibit were not, to my knowledge, used in the Ohio Telephone Rate Case. The percentages shown on this exhibit first appeared in the instant case in these exhibits. The other data is taken from various sources that have been previously made available to the defendants. I started to work on Exhibit A-100
1849 about a month ago. They are comparatively simple calculations, and were made by someone working under my direction; I should estimate that the whole business could be done in a day, and checked in one-eighth part of that time.

C. R. 64-A is a summary compiled from Monthly Report 6. Monthly Report 6 is a report sent by each of the associated companies to the American Telephone and Telegraph Company in the regular course of business. Monthly Re-
1850 port 6 was refused to the defendants in these depositions, but C. R. 64-A was not refused. C. R. 64-A was compiled from M. R. 6 from each of the associated companies, and M. R. 6 was withheld from the defendants. Monthly Report 6 for the Long Lines Department was not withheld from the defendants.

M. R. 23 is one of the reports of the associated companies that was refused to the defendants. It is a monthly report sent by each of the associated companies (including the
1851 Bell of Canada) to the American Telephone and Telegraph Company. C. R. 89 is a summary report compiled by the American Telephone and Telegraph Company from Monthly Report 23, which is a monthly report sent in by the associated companies.

C. R. 51-A is a summary compiled from the M. R. reports of each of the associated companies. The M. R. reports used as a basis for 51-A are M. R. Reports Nos. 1 and 2.

1852 Exhibit A-101 is a comparison of the Chicago area with the associated companies. The figures on this exhibit were compiled about a couple of weeks ago, and were

not used in the Ohio case. C. R. 51-A and the M. R. reports referred to in connection with Exhibit A-101 are from the same sources as those referred to in connection with Exhibit A-100; exactly the same principle is involved here.

Exhibit A-99 has been in process of compilation for some months; I could not particularize. It was not furnished in the Ohio case.

The books and records underlying Exhibits A-100 and A-101 are in New York. Of course, the books of the individual companies are in the various states in which they operate, but the records which I used as the source of information for these exhibits are all in New York.

1853 "Mr. Blackman: I offer in evidence now, if your Honor please, Exhibits A-99, A-100, and A-101, both inclusive.

1854 "Mr. Goldstein: I object on the ground that the original sources from which the data was taken have been refused to us, and not made accessible, and there is no way we can check them.

"Judge Wilkerson: What is your reply to that objection?

"Mr. Blackman: This, your Honor: As to Exhibit A-99, the data there, according to the testimony of the witness, came from, or he took from this pamphlet of the Bell Securities Company, which the defendants offered in the New York case. They themselves offered that. They have all of the figures in front of them—

"Judge Wilkerson: The defendants?

"Mr. Blackman: The defendants, yes sir. They came to New York to take depositions and examined a great number of witnesses, and that exhibit is Exhibit 111, attached to their deposition filed in this court. It has not been read in yet, but it seems to me that that is a very technical position for them to take, when they have the figures that we are dealing with.

1856 "Mr. Blackman: In their depositions they called for a great many things which we had not submitted to them before. We had submitted thousands of things before that; but there were perhaps a few score that they did not get. In those depositions they asked for them, and in the course of

those depositions they identified this pamphlet of the Bell Securities Company, as Exhibit 111.

"Judge Wilkerson: They have not offered it here yet.

"Mr. Blackman: No, sir, not yet. But I say, I call your Honor's attention to that, that it has not been offered yet, but it seems to me that it is a good deal of a technicality, to object that there is no way of their checking this thing, when it is in the very document that they themselves have had introduced and attached to the depositions. Now, that is as to Exhibit A-99. This is the whole thing, your Honor—and I will have to give my friend Mr. Goldstein credit for a very adroit maneuver. We had this thing out last fall. These various reports of all of the different companies of the Bell System were asked for by the defendants. We declined. The matter came before this court, and this court decided that they were not entitled to them. It was a perfectly obvious fishing excursion, to get—

1857 "Judge Wilkerson: Well, is not what you are offering now a document which purports to be a tabulation of certain other documents which they have not been permitted to see?

"Mr. Blackman: Well, sir, this is the point: we have not permitted them to see the individual reports of the New England Company, the Southwestern Bell, and this, that and the other company, because there are certain things in those reports that we think they have no right to see, that have no bearing on this case, and we do not care to have our business spread broadcast any more than we have to.

"Judge Wilkerson: Well, if that is the situation, why do you not have to forego, then, the right to put in this tabulation, if you are not willing to let them see the reports?

"Mr. Blackman: Well, sir, I was just coming to that. From these individual reports, that is, the individual reports from the companies, which are not made up by the American Company at all, but are made up by the New England Company, and the other companies, in the ordinary course of business, the American Company makes up tabulations for

1858 all of the companies. Now those tabulations are what we are using. Those are the only figures we are using,

and all of those reports have been given freely to them. They have been given the individual figures for the Long Lines. We are using them. They have been given the System figures, and we are using them; and those figures have been freely offered to them. Now they say, 'Because you got those System figures from the individual reports of the New England Company, the Southern New England Company, the New York Company, and the 23 other companies, we object to this, because you have not given us those things.' Now we do not make this up at all—and by 'we' I mean the Illinois Bell, or the American Telephone and Telegraph Company. That is information that comes to us from the outside. So far as our reports that we make up are concerned, we have given them to them, and that is all that we are using. We are using nothing here, about these individual companies. We are using here only the System as a whole, as compared to the Long Lines, that is all. We have used those ratios. Now, it is a perfectly simple thing; there cannot be any doubt about the figures. Of course, that does not perhaps meet the legal situation, but I cannot see any doubt about the figures. These ratios can be checked by them; they have all of the information with which to do it; they have been published broadcast in dozens of publications, and there is no possible doubt about them. The only thing is that my friend, Mr. Goldstein, is clever enough to take advantage of this, to try and extract from us these individual reports, which we have declined to let him have.

"Now, I do not think that there is a good legal foundation for it.

"Judge Wilkerson: Well, I am not so much concerned about the foundation for his attempted extraction of the information as I am about the legal foundation for admitting these documents in evidence—

"Mr. Blackman: Yes.

"Judge Wilkerson: —when the basic figures are not here, now.

"Mr. Blackman: Well, but the basic figures are, your Honor, in my opinion. These figures came from our reports—

"Judge Wilkerson: Requiring you to produce those reports is one question.

1860 "Mr. Blackman: Yes?

"Judge Wilkerson: And admitting compilations made directly or indirectly from them, it seems to me, presents a different question.

"Mr. Blackman: Certainly it does, sir. But those reports are only indirectly concerned here, and as I say, those are not our reports. The reports that we make up in the regular course of our business are the reports which we have submitted to them.

"Judge Wilkerson: But your reports deal with the business of these other companies.

"Mr. Blackman: Yes, sir, they do.

"Judge Wilkerson: And your reports are based in turn upon the information which you get from them.

"Mr. Blackman: Yes.

"Judge Wilkerson: Now you say, 'We should not be required to produce those reports because they contain information on a great many subjects with which these defendants have no concern'—'with which they are not concerned.'

1861 And we have agreed with you on that.

"Mr. Blackman: Yes, sir.

1862 "Judge Wilkerson: Now, then, you come in here, and you want to use certain ratios with a view to apportioning among these companies certain items of expense, the net result being, you get into the expense, on the expense side of the Illinois Bell, when we come to determine what is to be deducted from gross earnings, you get into that, a figure which is based on these ratios. Now, that is what it ultimately leads to, is it not?

"Mr. Blackman: That is true.

"Judge Wilkerson: That is to say, one of the figures in that column depends upon that ratio for its accuracy, and that ratio is one which is determined from the report of your Company, which in turn is compiled from the reports of these other companies. Now, of course, I understand that.

"The courts are in cases of this kind very liberal in permitting compilations to go in, and in the expedition, or in the

interests of saving time, do permit a great many things to go in which, according to the strict rules of documentary proof, would not have been admissible fifty years ago, 1863 to say the least.

"Mr. Blackman: Yes, sir.

"Judge Wilkerson: Now, I would have no difficulty about these compilations at all, if the other side had had the opportunity to inspect these figures. I would not require you to bring them all in here, nor would the court permit them to be brought in, when compilations could be made which would answer the purpose.

"Mr. Blackman: I might say this, your Honor: I do not think that there would be the slightest objection to the defendants inspecting those underlying reports, as they call them—although I do not think that they are really that, legally; I do not think that there would be the slightest objection to their inspecting those reports insofar as they relate to the figures which we have used. Now, insofar as they show—

"Judge Wilkerson: Well, that of course goes—that is a rule with which we are familiar, that where you have to go into book accounts, and the book contains matters with which the other parties are not concerned, the courts, of course, will not permit an inspection of all of the books, but only of that portion of them which is pertinent.

1864 "Mr. Blackman: That is our point here, sir.

"Judge Wilkerson: Well, will that satisfy you, if you are allowed to look at the portions of the reports which are pertinent to this matter? Now, of course, back of that—I know exactly what Mr. Haight is going to say. He is going to say that that leaves to the parties in the case a determination of what figures are pertinent.

"Mr. Blackman: No, if your Honor please; it does not in this case, no.

"Judge Wilkerson: But that is the same objection that comes up when we seal all of the pages of a book, except one page; that same question comes up in that case.

"Mr. Blackman: In this case it is a very simple question, your Honor. Those reports show the plant of the Company.

Now, insofar as they show the plant, plant figures, we will let them see them. Those reports show people; they show these specific things—this witness has said that—and those we will let them see. Now, those reports contain many other comparisons that have nothing in the world to do with what this witness has testified to. Now, those—

"Judge Wilkerson: I can see how that might be
1865 embarrassing how there might be information there which would be embarrassing to some of those companies.

"Mr. Blackman: Certainly.

"Judge Wilkerson: In their relations with the rate-making bodies—

"Mr. Blackman: Certainly.

"Judge Wilkerson: —of the states in which they are operating.

"Mr. Blackman: Certainly.

"Judge Wilkerson: I can understand that. If there is no such controversy as that existing now, it is a question whether in this lawsuit there should be stirred up a controversy in other states which are not contesting with you now. I understand that phase of it. I suppose that is a good objection.

"Mr. Blackman: Your Honor has put your finger directly on the point.

"Judge Wilkerson: I do not suppose that these gentlemen are interested in stirring up litigation any place else. They are interested in winning their lawsuit here, and if they have the basic figures relating to those things which you have put in, I suppose they will be satisfied.

"Mr. Blackman: I think I may say—although, of course, I cannot speak for the Company; I would have to con-
1866 fer with Mr. Braeelen, but I think we would be willing—

"Judge Wilkerson: Well, are you through with this witness?

"Mr. Blackman: —to bring all of those in—

"Judge Wilkerson: Did you have any further examination?

"Mr. Blackman: No further questions.

"Judge Wilkerson: All right.

"Mr. Blackman: I would be willing to say, we would be willing, I think—

"Judge Wilkerson: I think we can dispose of this.

"Mr. Blackman: —to bring all of those papers here.

"Judge Wilkerson: I would like to leave it in such shape, now, that it will work itself out automatically—unless it is brought to the attention of the court in some other way. I think I will admit the documents in evidence, as I have the other documents, but let the record show, motion to strike, unless and until there has been a compliance with the request of counsel for an inspection of such portions of those underlying reports as are deemed by them material to the ratios which are introduced. Now, try to work that out among yourselves.

"Mr. Blackman: All right, sir, and if we have trouble—

"Judge Wilkerson: And if you cannot work it out, 1867 then counsel for the defendants may bring it before the entire court, on the motion to exclude the exhibits. If such motion is not made by them, I shall assume that in some way or other they have satisfied themselves of the substantial accuracy of the ratios shown by the exhibits.

"Mr. Blackman: I would suggest this, that if we cannot agree with the defendants, we might bring them here, and submit the papers to your Honor—

"Judge Wilkerson: I have no doubt—

"Mr. Blackman (continuing): —we have no objection to your Honor seeing them.

"Judge Wilkerson: I have no doubt that you will find some way of working it out among yourselves. I think we understand what it is that Mr. Goldstein wants, and I think we now understand your objection to permitting an inspection of all of those reports. You are all lawyers, and I think you can work it out.

"Mr. Bracelen: I think Mr. Goldstein has understood our objection to giving him those monthly reports. It has been as Mr. Blackman has stated."

RICHARD H. GREGORY, recalled as a witness on behalf of the plaintiff, having been previously duly sworn, further testified as follows:

Re-direct Examination by Mr. Thompson.

March 23, 1932.

1868 The Graybar Electric Company on January 1, 1926, took over the business formerly done in the United States by the Supply Department of the Western Electric Company. The Supply Department of the Western Electric Company never did any business with the Bell associated companies and the Graybar Electric Company has never done any business with the Bell associated companies. So all of the transactions in connection with the Supply Department of the Western Electric Company, its sale to the Graybar Electric Company and the sale of the stock of that company to the Management Corporation of the Graybar Electric Company have no relation whatever to the profits on the Bell business of the Western Electric Company.

1869 During my cross-examination, there was marked for identification Defendants' Exhibits D-53, D-54 and D-55, certain balance sheets and profit and loss statements of the Teletype Corporation, and a statement showing the circumstances of the purchase by the Western Electric Company of the stock of the Teletype Corporation. The balance sheet so identified shows the physical assets of the Teletype Corporation at the end of 1930 were approximately $8,000,000, and the purchase price was $30,000,000. There are no assets of the Teletype Corporation included in the average investment used for the purpose of arriving at a return on Bell
1870 business in Plaintiff's Exhibits A-77 and A-78. In the consolidated statement (Exhibit A-84) figures are included for the Teletype Corporation for the period October 1, 1930, through December 31, 1931, and covering the investment of the Western Electric Company in the Teletype Corporation representing the purchase price that we paid for that

company, after giving due effect to the operations of that company since its purchase.

Exhibit H-54 shows that the Western Electric Company purchased the stock of the Teletype Corporation on a basis that shows earnings of between 12 and 13 per cent on the purchase price; that earning factor was taken into consideration in arriving at the amount paid for its stock.

We have made the investigation with respect to the depreciation practices of the 88 companies listed in the Exhibit A-85 which I was asked to make in my cross-examination.
1871 For 82 of the 88 companies there is no reference that I could find to the Federal Income Tax returns with respect to the depreciation rates; in 6 of the companies there is such a reference. The policy as to depreciation is mentioned in specific percentages in 50 companies, in general statements by 10 companies, and 28 companies make no statements at all.

29 companies have rates on buildings less than the Western Electric; 21 have rates on machinery less than the Western Electric; and 5 have rates on service equipment less than the Western Electric. There is one company that has the same rate on buildings; 14 that have the same rate on machinery as the Western Electric; and 3 that have the same rate on service equipment as the Western Electric. There are
1872 8 companies that show varying rates for buildings ranging above and below the Western Electric Company; there are 4 that show that spread above or below on machinery and 1 on service equipment; as to these cases there is no way of telling whether they are above or below the Western Electric Company. There are 4 companies which show a rate higher than the Western Electric on buildings; 3 higher on machinery; and 22 higher on service equipment.

The Air Reduction Company shows a rate on buildings ranging from 2 to 33⅓ per cent; Columbian Carbon Company shows a rate ranging from 5 to 33⅓ per cent; The National Supply Company shows rates ranging from about 3 to 10 per cent; A. O. Smith, 7 per cent; Du Pont, 3 to 6 per cent normal and 3 to 20 per cent special; International Cement, 6¼ to 6½ per cent; United States Gypsum, 4 per cent on buildings and

equipment; and United States Industrial Alcohol, 21 to 36 per cent.

1873 In arriving at the 88 companies shown on Exhibit A-85, I started with industrial companies listed in the Standard Statistics Bulletin. There were 579 companies listed in that bulletin. 308 of these companies were excluded because they were not comparable. Some were foreign companies; some were engaged primarily in merchandising, such as Sears Roebuck and Montgomery Ward; some were extractive industries; and the steel companies were excluded for the reasons that I gave on my direct examination. This group was excluded because the businesses in which they were engaged were not comparable with the Western Electric Company.

1874 Of the remainder, 110 companies were excluded because of inadequate information, primarily with reference to the treatment of depreciation reserves. Of the number still remaining, 77 were omitted on account of size; that is, their net profits were, in more than one year out of the 5 years, less than a million dollars, and for that reason I did not believe them fairly comparable with the Western Electric Company on account of their size. This left 84 companies and we added the St. Regis Paper Company, the Torrington Manufacturing Company, the Dennison Manufacturing Company, and A. G. Spaulding; the data concerning all of these 4 companies are contained in either Poor's or Moody's Manual.

We did not deduct from the average investment figures appearing in Exhibits A-77, A-78, A-79 and A-80, the interest-bearing obligations due from the Western Electric Company

to the American Telephone and Telegraph Company and

1875 to the Trustees under our pension fund, because they represented money invested in the business.

The Western Electric Company makes no guarantee to the Bell associated companies to whom it sells telephone apparatus and lead covered cable against any loss which might be sustained by those companies on account of patent infringement in connection with apparatus sold to them by the Western Electric Company.

At the time that the new contract between the Western Electric Company and the Automatic Electric Company was entered into, in 1927, there was a reduction in the price agreed to be paid by the Western Electric Company for the step-by-step equipment to be purchased from Automatic. This was a reduction of approximately two and one-half per cent
1876 on the purchase price of all apparatus which we expected to purchase during the contract period. That figure was based upon the estimated purchases of the Western Electric Company during the term of the contract. Later the Western Electric Company obtained additional price reductions from the Automatic Electric Company. In 1929, due to the large volume of business we were placing with the Automatic, arrangements were made whereby the Western Electric Company received an additional price reduction varying according to the quantities which were purchased; it was a quantity discount.

The licenses which we obtained from the Automatic Electric Company to use certain patents owned by it, gave the Western Electric Company the right to manufacture the step-
by-step telephone apparatus made by the Automatic.
1877 These licenses were acquired by the Western Electric from the Automatic Electric prior to the Western Electric Company making any contract for the purchase of telephone equipment from the Automatic Electric Company.

I prepared the statement identified as Plaintiff's Exhibit A-109. This exhibit shows the sales of special commercial products by the Western Electric Company for the period 1916 to 1931, inclusive. It shows the various classifications of special commercial products sold by years and divided between Bell and non-Bell business. It shows that the total amount of the special commercial products was 3.4 per cent of all the Western Electric Company manufactures. In the
last column it shows that the special commercial prod-
1878 ucts was 32 per cent of the total sales to non-Bell customers during the entire period 1916 to 1931.

Exhibit A-83 shows the annual effect of certain price reductions made by the Western Electric Company in the years

1921 to 1930 in its sales of telephone apparatus to the Bell associated companies. These price reductions shown in the exhibit are non-cumulative. I testified that, by reason of these price reductions, the telephone apparatus purchased by the Bell associated companies in 1930, at 1930 prices, represented a saving of $97,000,000 over apparatus purchased at 1921 prices. There was a slight reduction in raw material prices between 1921 and 1930, and there was an increase in wages during the same period. The effect of the wage increase more than offset the reduction in the price of materials, and we can, therefore, fairly ascribe the whole amount of $97,-
1879 000,000 as due to the improved efficiency of operations of the Western Electric Company during that period.

If, in the preparation of Exhibits A-77 and A-78 (showing the return on investment in Bell business), I had treated the property transferred from the Western Electric Company to the Bell Laboratories as remaining with the Western Electric Company, it would have added approximately $450,000 to the profit on the Bell business in the period, and would have increased the earnings on the Bell business .02 per cent for the period 1916 to 1931 and .03 per cent for the period 1923 to 1931.

1880 I have ascertained the fact as to whether or not the cost to the Western Electric of purchases aggregating $102,000,000 for the period 1921 to 1930 from others of apparatus and equipment designed entirely or in part by Western, but manufactured by others, was included in the cost of sales apportioned between Bell and non-Bell business in my exhibits. Those costs are included in the cost of sales, but are not included in the cost of sales in allocating the current variation of our shop results.

The sales expense of the Graybar Electric Company
1881 for the years 1926, 1927 and 1928 (during which time it was a subsidiary of the Western Electric Company), was 5½ per cent.

I know the profits that have been made by the Western Electric Company and the Electrical Research Products, Inc., out of the talking movies from the time the development of

sound picture equipment was started. For the period 1926 (which was the year prior to the formation of the Electrical Research Products Company) to 1931, the profits of the Western Electric Company and the Products Company, and the Products Company's subsidiaries, were $18,000,000. Of this total sum, $6,400,000 represents profits made by the Western Electric Company on the sale of its manufactured articles to the Products Company. This profit was realized by the Western Electric Company after including in the cost of sales to the Products Company $3,500,000 of development expense for which it had made no expenditures and for which the
1882 Bell Companies received credit. $11,600,000 was made by the Products Company and its subsidiaries. In its first year of operation, the Products Company lost approximately $1,000,000 on the sound picture business. In 1931, it lost $2,300,000 on this business, but in the intervening years, that is, 1928 to 1930, it made $14,900,000 on the business. During this period of time, the Western and the Products Company have made approximately 14¼ per cent earnings on investment from the sound motion picture business.

1883 In the limited time available, we have not been able to cover the whole 88 companies to ascertain the ratio of cash and cash items to total investment of each of those companies. We have examined 14 of the large companies whose investments aggregate 56 per cent of the total of the 88 companies. The ratio of total cash and cash items to total investment of these 14 companies is 17.2 per cent, as compared to the 5.4 per cent for the Western Electric Company on its Bell business during this period.

Prior to the organization of the Bell Telephone Laboratories, the Engineering Department of the Western Electric Company did research and development work for the American Telephone and Telegraph Company, in addition to that work done for the Western. That research and develop-
1884 ment work done for the American Telephone and Telegraph Company was paid for by it.

The profits made by the Western Electric Company in the years 1916 to 1926, inclusive, on instruments sold to the

American Telephone and Telegraph Company, are included in the profits shown on Bell business in Exhibits A-77 and A-78. The sales prices of these instruments were determined in accordance with the terms of a contract dated February, 1882, which contract and a modification of it under date of April, 1908, were put in evidence on the former hearing of this cause as City's Exhibits 60 and 61. Because of this contract, this item of manufacture was dealt with in a manner different from
the manner in which we dealt with our other items of
1885 manufacture. A special study was made of the costs
and profits on that particular business.
1886 The document identified as Plaintiff's Exhibit A-110
shows this information, which was asked for by Mr. Goldstein. This exhibit shows the net profits on sales of new instruments to the American Telephone and Telegraph Company for the period 1916 to 1926, inclusive. It shows the sales year by year, the net profit on sales before deducting Federal taxes, and the per cent net profit to sales before Federal taxes. It shows the Federal taxes year by year and the net profits after deducting Federal taxes, both year by year and in total. It also shows that the per cent net profit to sales for this period of eleven years is 13.6 per cent. The sales were approximately 80 per cent of the average investment in this class of business and the earnings on investment during this same period were approximately 11 per cent.

Exhibits A-77, A-78, A-79 and A-80, show the profits
1887 and earnings on investment of the Western Electric
Company in its Bell and non-Bell business for the period covered by those exhibits. When these exhibits were prepared, we had as a starting point the actual earnings of the Western Electric Company on its total business for each of the years included in the exhibits. Having those actual earnings on the total business for each of the years, what we have done in these exhibits is to apportion the investment and earnings between Bell and non-Bell business for each of the years of the total period and for the total period covered by the exhibits on certain bases.

In making these apportionments, we did not have the actual

cost of each of the more than 100,000 items manufactured by the Western Electric Company, nor did we have the actual cost of each of the more than 20,000 assembled articles of Western Electric manufacture. It was not necessary to
1888 apportion all of the investment and expenses as between Bell and non-Bell business, as parts of the investment and some parts of the expenses were directly allocable to Bell and non-Bell business and required no apportionment. Where such apportionment was necessary, it was made between Bell and non-Bell business mainly on the basis of the shop cost of sales. These standard shop costs of sales were not prepared specifically for use in this case; they were used currently, year by year, during the whole of the period.

The average investments of the Western Electric Company and its earnings on investment in both the Bell and non-Bell business were obtained each year during the period shortly after the close of the year's business.

1889 Standard shop costs are quite generally used in industries throughout the United States.

In the Western Electric Company, the aggregate of these standard shop costs varies from the aggregate of the actual costs during the periods inquired into. This overall variation for the period 1921 to 1930 was 2 10 of 1 per cent. There was a variation for the period 1923 to 1931, amounting to 7 10 of 1 per cent.

In each year we ascertained the aggregate of the standard costs for all of our manufactured products and compared such aggregate standard costs with the aggregate of the actual shop costs of such manufactured articles. We found that the aggregate actual costs are either above or below the aggre-
1890 gate of the standard shop costs, and the difference we called "current variation". During the period 1923 to 1930, the greatest difference between the aggregate standard shop costs and the aggregate of the actual shop costs was in 1925, when there was a variation of $10,047,000. That is, in that year the actual costs were higher than the standard shop costs by $10,000,000. This $10,000,000 variation was divided $7,847,000 to lead covered cable, $126,000 to special commercial

products, and $2,074,000 to telephone apparatus. That
1891 division was made from the records on the books in the case of lead covered cable and by special studies in the case of special commercial products. (In 1931 the volume was relatively small and only in part was there a necessity for special study for special commercial products.) We made these special studies for these variations on special commercial products, but the records of our operations show how much of this variation arises out of the manufacture of lead covered cable and how much out of telephone apparatus.

The price at which copper has been included in the standard shop costs from 1925 to date is 15 cents a pound; the actual price of copper has varied substantially above and below that figure. There have also been some variations between the cost of lead and the figure at which lead is included in
the standard shop costs. The variations in either cop-
1892 per or lead as between the actual costs and the standard costs could not in any way effect the apportionment of the variation of $7,847,000 applicable to lead covered cable for the year 1925 as between Bell and non-Bell business. This is true because the same types of cable are sold to both Bell and non-Bell customers. The variations in labor, materials, or overhead (which are the three elements in our standard shop costs), as between the aggregate standard shop costs and the aggregate of the actual costs would not affect the apportionment as between Bell and non-Bell customers of this $7,847,000 variation applicable to lead covered cable in the year 1925. That is true because, as I just pointed out with reference to the material, the same types of cable are sold both to Bell and non-Bell customers.

In addition to this variation of $7,847,000 on lead covered cable, we had a variation of $2,074,000 applicable to telephone
apparatus, and of $126,000 applicable to special com-
1893 mercial products. What I have just stated with reference to the variation for the year 1925 with respect to lead covered cable applies equally to the apportionment of this variation of $2,074,000 on telephone apparatus. Here again this is true because we sell similar types and character

of telephone apparatus to both Bell and non-Bell customers. So the variation between the aggregate of the actual shop costs and the aggregate of the standard shop costs on telephone apparatus for that reason would make no difference at all in the apportionment.

On special commercial products, a special study was made to see what the current variation applicable to that 1894 business was, and that study resulted in this figure of $126,000, which was apportioned between Bell and non-Bell business on the basis of the cost of sales to Bell and non-Bell customers. 92 per cent of that business is with non-Bell customers, and only 8 per cent with Bell customers, so only 8 per cent of this item of $126,000 was in that particular year apportioned to the Bell business of the Western Electric Company.

"Q. Now, I have purposely taken the year 1925 in order that we might discuss this with definite figures before us. I want to know whether the validity of your apportionments for any other year than 1925 is in any way affected by the variations which we have been talking about in each of those years?

"A. It is not."

In addition to the apportionment of this variation, we also apportioned certain expenses between Bell and non-Bell customers on the basis of the aggregate standard shop cost 1895 of sales. These items so apportioned were development expense, distribution expense and inventory revaluations. Development expense was entirely apportioned on that basis. Some part of the distribution expense is directly allocable to Bell or non-Bell business, and the remainder was allocated on the basis of standard shop cost of sales (probably one third of the expense of distribution is directly allocable; 37 per cent was directly allocable for the year 1929 and the remainder was apportioned for that year on the basis of the standard shop cost of sales). The inventory revaluations were directly divided in part, so far as the study indicated that they should be so divided. Where it was impossible 1896 to make that division directly, the division was made on

the basis of the standard shop cost of sales. So far as these expenses are concerned, in no one of the years could any variation between the standard shop cost of sales and the actual cost affect in any way the apportionment of those expenses between Bell and non-Bell business.

"Q. I want to direct your attention now to your testimony at page 1127 of the transcript, in which, in answering a question propounded to you by counsel for the defendants as to why the entire pension fund accrual for 1924 had been charged against the Bell business, you said, and I now quote your language:

'It was because, as I explained, during those years, and in all of these exhibits, what we are showing are the 1897 actual figures which were made up for administrative purposes in those particular years. Now, if we went back now and made a redivision in the light of our present information, we would find some that we would add to Bell, and some that we would subtract from Bell.'

"I also call your attention to your testimony at page 1578 of the transcript, where you were being asked by Mr. Goldstein about the amount of cash and cash items included in the average investment of the Western Electric Company for the year 1925, in which you were referring to reports made currently by the Western Electric Company year by year, and in which you said—I now quote your language—

1898 'And they were used for administrative purposes, and if you should go back now, in the light of present information, you would make changes all the way through. Now, my estimate of what that change would be as a whole, would be that there would be practically no difference in the rate of return, even if we made all of the adjustments that we might consider necessary.'

"I want you to state now the particular items which you had in mind when you made those answers. So that there may be no misunderstanding about this question, I desire you now to indicate what items there are which enter into your Exhibits A-77, A-78, A-79 and A-80, which you would treat in any way differently than the way they have been treated if

you were now making the division between Bell and non-Bell business of the Western Electric Company?"

In 1924, an appropriation of $2,000,000 was made for the pension fund and charged entirely to Bell business. If I were to go back now and do it over again, I would charge $120,000 of that accrual to the non-Bell business, which would result in increasing the profits on the Bell business for that year by $120,000.

1899 Up to within four or five years ago, patents that were purchased have been charged to reserve for contingencies rather than included in the cost of sales, as shown in these exhibits. If I were to go back and do the job over again, I would charge those patents year by year against the cost of sales in those particular years. The result of that change would mean that I would add $2,208,000 to the cost of sales in the Bell business, and, therefore, reduce the return on the Bell business by the effect of that amount.

The next item that I have in mind is the reserve for machinery. In 1928 we made a reserve for machinery of $2,000,000, representing the difference between 7.5 per cent and 10 per cent, as a result of a study indicating that our rates had been too low for some three or four years preceding. This $2,000,000 in our exhibits was charged against 1928 earnings. If I were to go back and do the job over again, I would apportion it between the years 1924, 1925, 1926 and 1927; that

1900 would make no difference in the amount for the period 1916 to 1931 or for the period 1923 to 1931.

In the period 1924 to 1927, we made an extraordinary reserve for depreciation of $8,233,000. If I were to do that job over again in the light of our present knowledge, and if it were possible to allocate it by years, I would say that that amount should be allocated over the period during which the additions were made (which was the basis of this computation, that is, from 1917 to 1927, inclusive).

If I had had foresight as to what Federal taxes were going to be paid, of course, I would have included the amount that we paid during the year and not the accruals, but at the time we close the books in each year we have to go by the accruals,

which are always different from the amounts we finally pay to the United States Government. There was approximately from one hundred to two hundred thousand dollars difference between our accruals for Federal income taxes over this period and the actual payments.

The items to which I have just referred are the only ones in which I would make any changes if I were making a redivision or reapportionment in the light of my present knowledge.

1901 If all these various changes which I have just been talking about should be made, it would reduce the return on investment on Bell business for the period 1916 to 1931 from 6.6 per cent to 6.5 per cent, and for the period 1923 to 1931, it would increase the return on investment for Bell business from 7.1 per cent to 7.2 per cent. These various changes would have only a negligible effect on Exhibit A-84 (which is a consolidated earnings statement for the years 1916 to 1931), which would be on account of Federal taxes. I did not make the apportionments shown on Exhibits A-77, A-78, A-79 and A-80, merely because they were made currently; I made them because they are right.

1902 In response to the question on cross-examination with reference to the appraisal made in 1927 of the Western Electric Company, I stated that the appraised value of the plant and property of the Company, less depreciation, was somewhat greater than the book cost of the plant as I define that book cost. I furnished yesterday the underlying data on this appraisal to counsel for the defendants. There was nothing included in this appraisal for going concern value, for patents, or for development expense. What was done was to arrive at the reproduction cost, less depreciation, of the physical property.

1903 During the period 1923 to 1931, the return on investment on Bell business was 7.1 per cent and on non-Bell business 11.3 per cent. All of the profits on the sales by the Western Electric Company of telephone apparatus to non-Bell customers are included in those non-Bell profits. The prices to non-Bell customers on telephone apparatus are

never lower, and are usually higher than the prices to Bell customers. The earnings on investment on telephone apparatus sales to Bell customers for the period 1923 to 1931 was 7.7 per cent, and to non-Bell customers was 13.4 per cent.

Re-cross Examination by Mr. Goldstein.

March 24, 1932.

1905 A study which I made indicated that the aggregate of the adjustments increasing or decreasing the gross profits neutralized themselves (with the exception of .2 of one per cent) for the period 1921 to 1930. The sheet 1906 marked for identification as Defendants' Exhibit D-80 is the study underlying that conclusion. That statement indicates the adjustments of the variations in shop operations during the year. The study includes the inventory revaluations which affect shop operations but does 1907 not include other inventory revaluations or other miscellaneous adjustments. In 1929, the amount of the adjustments which I took into account showed a net aggregate of $1,250,000. The study is intended to cover only the shop operations and the result of the inventory revaluation in the shop. It does not cover inventory revaluations of completed merchandise not in shop nor other adjustments which are now the subject of conference between accountants for the defendants and myself.

1908 My conclusion throughout my testimony that the extent of the variation was only .2 of one per cent is confined solely to those adjustments that enter into shop 1909 production, and nothing else; but in the shop production is where there is a great possibility of variation. I think we will find, when we get through our conference, that the other adjustments are more directly allocable to different classes of business than are, perhaps, the shop operations. We do not allocate all of the adjustments on the basis of shop cost of sales; some are directly allocable. For instance, our program with the Electrical Research Products Company is that it will carry all the completed merchandise for sound

picture equipment; that is, we ship that merchandise to them as soon as it is made so there is no adjustment for completed merchandise inventory revaluation applicable to sound pictures; they are completed merchandise.

So far as the spreading of the inventory revaluations 1910 and inventory adjustments between the Illinois Bell Telephone Company and the Bell System is concerned, I considered that the Illinois Bell represented a fair cross-section of the entire Bell business of the Western Electric. In my opinion, over a period of years this fair cross-section will take care of the adjustments that decrease or increase the profits.

My conclusion throughout my testimony as to the effect of the adjustments was not confined to the subject matter covered by this study; the study was involved only when 1911 I mentioned the .2 of one per cent. Similarly, when I mentioned the .7 of one per cent for the years 1923 to 1931, it was only intended to cover the particular variations included in the study.

The study which I have been talking about and which has already been made is the one shown on Exhibit D-80.

In connection with my testimony on re-direct, I spoke of the 1925 adjustments of which a greater part was cable. 1912 The excess of the current cost of the raw material over the standard shop costs accounted for a large part of that adjustment; I do not have in mind how much.

"Q. And that excess was provided for in the prices actually charged to the customers, in connection with cable, for that year; is that correct?"

The prices of cable since 1924 have been fixed on a commercial basis and not on a cost-plus basis; they have been fixed for the Bell Companies at a lower price than made to our distributors, but our distributors have been able to make a substantial profit in competition with other manufacturers of cable on that cable which was sold them by us.

"Q. The fact that I am trying to try out, or that I 1913 am trying to bring out, is this, that in 1925 this excess of cost was absorbed by the prices charged during the

year for the cable, which was not an adjustment that was made, that resulted at the end of the year, when your prices had not absorbed it during the year."

We attempted, of course, to make our prices of cable commensurate with the cost, including the changes in the cost of material that went into the cable from time to time. This same general practice is not followed in the case of telephone apparatus, although if there is a material change in the cost of production of a particular piece of telephone apparatus, the price might be modified in any one year without
1914 having a general price level change, up or down. The cable prices are naturally more responsive to fluctuation because of raw material prices than are the prices for telephone apparatus; this is because lead and copper constitute such a large portion of the cost of the cable.

(Document furnished by plaintiff in response to request of the defendants showing the standard and current costs of copper and lead in the years 1918 to 1931, inclusive, marked for identification as Defendants' Exhibit D-81.)

The document marked for identification as Defendants' Exhibit D-81 is correct.

In 1924, we began to draw our own copper wire at
1915 Hawthorne. Prior to that time, we were buying our wire from the outside. Exhibit D-81 shows the copper bar price; we had no real information as to what the price was prior to 1924.

The standard price for copper is still maintained in 1932 at $15.00. We have purchased very little copper this year, as we had purchased our requirements prior to the end of 1931.

The standard cost figures for lead since 1926 have been
1916 maintained at $8.00, and the standard is the same for 1932. Our purchases of lead are also very limited as to amount under present conditions.

In 1925, our adjustments on lead covered cable represented the major portions of the total adjustments in the factory. I do not carry in mind whether this was true of the other

years, but it is a matter of record which can be obtained if counsel for the defendants desire.

1917 Defendants' Exhibit D-80 for identification was prepared shortly after the end of 1930; probably around a year ago. In that study the figures are related to a base of output to arrive at the .2 of one per cent. By "output", I mean the aggregate charges made by the shop for merchandise delivered to the Merchandise Department, whether

1918 sold or not sold. It is the cost of production of the shop for the year and not the cost of sales.

When, in the course of my re-direct examination, the following question was asked me:

"Q. Now did the aggregate of the standard shop costs vary from the aggregate of the actual costs during the periods inquired into?"

And the answer is:

"A. They did."

I understood "actual costs" to mean, when I later on related it to the .2 per cent of the shop, the shop production figures. To make it complete, the question should be, "Did the aggregate of these standard shop costs vary from the aggregate of the actual shop costs?"

And then the question is:

"Q. I believe that you have stated that this over-all variation for the period 1921 to 1930 was .2 per cent. Is that correct?"

1919 And the answer is:

"A. That is correct."

"Mr. Goldstein: Now by the words, 'over-all variation', you mean, over-all—or you understood that to mean, over-all shop cost variation?

"A. Yes, sir.

"Q. And not over-all variation for all factors of adjustment, is that correct?

"A. That is correct.

"Q. You were asked:

'Q. Was there a variation for the period 1923 to 1931?'

"And the answer is:

'A. There was.

'Q. What was the variation?

'A. .7 per cent.'

"Your answer was intended to show the extent of the variation of shop cost adjustments only?

"A. That is correct.

"Q. And the next question:

'Q. Do you in each year ascertain the aggregate of the standard costs for all of your manufactured products and then compare such aggregate standard costs with the aggregate of the actual shop costs of such manufactured articles in the same year?'

1920 "And the answer is:

'A. We do.'

"And the next question is:

'Q. You then find that the aggregate actual costs are either above or below the aggregate of the standard shop costs, is that correct?'

'A. That is correct.

'Q. Now, when you get that difference, what do you call it?

'A. We call it; current variation.'

"Now, in each of these questions, and your answers, they were intended, were they not, to cover only the comparison between the standard shop cost and the actual shop cost?

"A. I was talking about shop operation.

"Q. Yes?

"A. Yes, sir.

"Q. And you understand the question to only include that—

"A. That is correct.

"Q. —comparison?

"A. Yes, sir.

"Q. And not the comparison between the total of the aggregate costs, and the actual costs?

"A. That is correct."

1921 When I speak of current variations throughout my

testimony and in this connection, I mean the current variations in shop costs. To my knowledge we do not use the term "current variations" in connection with inventories; we call the other items "adjustments" rather than current variation. Current variation is really confined to shop results.

There has been delivered to the defendants a copy of the letter to which I referred in connection with the sale of the option on the International Telephone Sales and Engineering Corporation for $4,000,000.

(Which said letter was marked for identification as Defendants' Exhibit D-82.)

When Mr. Edgar S. Bloom signed this as President, he was signing it as President of the Electrical Research Products.

I know what Mr. Bloom had reference to when he said, "I agree that in the event the results should not conform to the expectations between now and December 31, 1930". At the time of the agreement, a study was made of the probable business that would be given the Automatic Electric by the Western Electric Company through the period ending December 31, 1930, and also of the profits on that business. That is the study Mr. Bloom had in mind, when he spoke of expectation, at the time the letter was written.

The option price of $4,000,000 was to be reduced by an amount not exceeding $1,000,000, if the Automatic Electric Company did not receive a certain amount of business and a certain amount of profits from the Western Electric Company. The amount of business given to the Automatic Company is indicated on the sheet identified as Defendants' Exhibit D-83. The apparatus indicated on this exhibit (D-83) as purchased from the Automatic Company is step-by-step equipment and practically all, as I understand it, was sold within the Bell System.

The prices established by the Automatic for this equipment since 1927 were those established under the contract made in 1927, to which I referred the other day as part of the transaction in which the sale of the option was made. As

I stated, a study was made of the probable profits to the Automatic Company out of this future business. The actual amount of business and profits were more than were indicated in that study. Mr. Gary and Mr. Bloom are not in accord as to what they meant by "coming up to expectations". Mr. Bloom had in mind the expectations of the profits on the business for the period ending December 31, 1930. Mr. Gary had in mind the expectation of profits 1926 at any time during the period 1927 to 1930 and the succeeding years under the contract. In other words, Mr. Gary feels that now the profits are not coming up to expectations; that is the basis of his claim for a $1,000,000 reduction in the payment that he has already made.

The memorandum of agreement referred to in the letter is in existence and is on its way here. The study to which I referred I do not think is on its way here.

"Q. Would you please make available at the time that you make available the memorandum of agreement, likewise the study?

1927 "Mr. Thompson: I object.

"Judge Wilkerson: The question is whether the witness will do it.

"Mr. Thompson: I object to the witness producing it.

"Judge Wilkerson: If he answers in the negative, then your next step is to apply for the proper kind of an order, if you think you are entitled to it.

"Mr. Goldstein: Q. Will you make available for inspection the study which you refer to, upon the basis of which the million dollar adjustment was to be made as provided for in this agreement?

"Mr. Thompson: I object to the witness being asked to produce something that is obviously not in his possession or under his control.

"Mr. Goldstein: Q. Is that study in your possession or under your control?

"A. That study is a study that was made, not by me, but by Mr. Bloom.

1928 "Judge Wilkerson: Q. Do you know where it is now?

"The Witness: Yes, sir.

"Judge Wilkerson: In whose custody is it?

"The Witness: I think that Mr. Bloom has it.

"Judge Wilkerson: You will have to make application for a rule on the company to produce it. The witness cannot be required to do it."

As I recall, the study simply shows the expected volume of business and expected profits during the period involved and contains no other items; that is, it is a statement of figures.

1929 (Counsel for plaintiff agreed to make available to counsel for the defendants, memorandum of agreement between International Telephone Sales and the Electrical Research Products, dated May 26, 1927.)

In connection with Defendants' Exhibit D-83, there are also purchases from the Kellogg Switchboard and Supply Company and from the Stromberg-Carlson Telephone Manufacturing Company. The $11,000,000 of purchases shown

1930 as coming from the Stromberg-Carlson Company was telephone equipment, some of which was undoubtedly sold to the Bell System. I think part of it was sold to the Graybar Company. I do not have in mind the division of the sales. I think the same thing holds true in the case of the Kellogg Switchboard and Supply Company purchases.

1931 (Document furnished to the defendants by the plaintiff, showing rented area leased before and after July 1, 1929; was marked for identification as Defendants' Exhibit D-84.)

Exhibit D-84 represents leases on July 1, 1929, and

1932 thereafter. At the end of 1928, we had leased 439,000 square feet of floor space, and at the end of 1929, 1,771,000 square feet of floor space, of which 556,000 square feet was leased after July 1, as shown on this exhibit. That would leave 776,000 square feet that was rented sometime between the first of January, 1929, and July 1.

(Document furnished to the defendants by the plaintiff,

showing additions to the pension fund and the credits for 1931, was marked for identification as Defendants' Exhibit D-85.)

1933 The actuarial computation for 1931 conformed to the conditions at that time as we figured it. Of course, we are all the time gathering knowledge on that, and if we should go back and do it over again, it would be an entirely different figure and probably higher, in my opinion. However, the actuarial computation for the particular year, as computed at that time, called for these identical additions.

1934 I said on my cross-examination that I was familiar with the principles involved in these actuarial computations, but that I was not familiar with the detailed mathematical computations made to determine the exact amount of the pension accrual needed in any particular year. By "principles", I mean that I know it is based on separation rates, salary basis and service, age of employees, and miscellaneous data of that sort; beyond that I am not familiar with it.

"Q. What is the fundamental principle which underlies the actuarial basis as applicable to the probable future separation of employees from the Western Electric Company?

"A. I cannot answer that question."

1935 I am not familiar with the details, but only with certain factors that are taken into consideration; I am not an actuary and I could not explain the details.

1937 "Judge Wilkerson: Are you familiar with the fundamentals so that you can state them?

"The Witness: If you mean by 'fundamentals' the underlying actuarial data that go back of these accruals, I am not familiar with them.

"Judge Wilkerson: All right.

"Mr. Goldstein: The actuarial principles not the details.

"Judge Wilkerson: Well, now, substitute the word 'principles' for the word 'details'?

"The Witness: Well, I am not particularly familiar with the details. I have assigned that job to Mr. R. W. Burgess, who is Chief Statistician of the Western Electric Company, in my department.

"Judge Wilkerson: Well, is he here?

"Mr. Thompson: Yes.

"The Witness: He is here.

"Mr. Haight: Now, if Mr. Burgess is not produced, so that we may inquire into it, of course it is valid ground
1938 for objection to everything computed thereon. That is our position, your Honor.

"Mr. Thompson: We are going to put someone on on this question.

"Judge Wilkerson: Very well.

"Mr. Haight: All right; that is all we want to know.

"Judge Wilkerson: Very well."

I stated that in connection with the study of the 88 companies I used the Standard Statistics Bulletin. I do not know whether the Western Electric Company gets the Standard Statistics Service individual cards; I presume it does.
1939 I personally have not seen them. I stated that the data was determined entirely from Poor's and Moody's Manuals and that the Standard Statistics Bulletin was no more than an index to determine the companies, concerning which we got the facts from Poor's and Moody's Manuals.

1940 I did not understand that I was to determine whether Western guaranteed non-Bell customers against infringements on apparatus purchased from Western.

(Counsel for the plaintiff agreed to furnish the information concerning guaranty to non-Bell customers to counsel for the defendants.)

There was a revision in the prices of the Automatic to the Western Electric Company from 1927 to the present
1941 time, which consisted of some lowering in the prices. The prices from the Automatic are based on a cost-plus basis, and the contract provides for a periodic investigation of these prices.

Exhibit A-83 is intended to show the effect of the price reductions for the year in which they were made, irrespective of the date upon which the particular reduction took place.

"Q. If a million items were sold in the year 1924, for instance, and on the last item, on December 29th of that
1942 year, you reduced the price $1, for the purpose of this study, you would show a reduction of $5,000,000; is that correct?".

The question is so exaggerated as to hardly be representative. We will take as an example the price reduction of July 1, 1929; we computed the amount of the price reduction on the volume of business in the year 1929 as if the prices in effect after July 1, 1929, were in effect for the whole year. We related back the price reduction to the sales made before
1943 the reduction, and arrived at what saving would have been made if the price reduction had been made the first of the year.

In connection with my statement on re-direct examination concerning the ratio of cash to investment in the industrials, as shown by Poor's and Moody's, we took the average amount of cash, computed in the same way as average investment. We took December 31 of the two years and divided the figure by two.

For the amount of cash included in our average investment
in Plaintiff's Exhibits A-77, A-78, A-79 and A-80, we
1944 took the average for thirteen months, but it would probably make very little difference. I do not know whether it would make any difference in connection with other companies, as I do not have the monthly statements of the other companies.

The net profits to sales on telephone instruments, shown in Exhibit A-110, is 13.6 per cent. I stated that the relation of sales to average investment is 80 per cent. The 80 per cent has nothing to do with the net profits to sales, but simply means this: for the purpose of illustration, if we had an investment of approximately $6,000,000, on which we made
sales of $5,000,000, we had less than one turnover a year.
1945 Net profits to sales is determined by the sales to the gross profits and expenses, and has no relation to turnover; the turnover only affects the return on investment. When you bring in turnover, you have to bring in the investment

and relate the net profits to the investment; then, if you have an investment which is higher than the sales, of course, the return on investment is less than the net profits on sales.

1946 Many manufacturing companies use standard costs. One of the uses of standard costs is to have a measure to determine the efficiency of the various departments and various operations of the manufacturing companies.

The studies which I stated had been made to separate the adjustments between telephone apparatus and special commercial products were not engineering studies but accounting studies. Of course, in making that accounting study we tapped all of the information we could get, in order to get an accurate result. It might be that engineers, and certainly people connected with the manufacture of special commercial products, were consulted concerning it, but it was not an engineering study but an accounting study.

1947 I spoke of an adjustment of $2,000,000 for machinery, made in 1928, and mentioned a study in that connection. What I had in mind was that we had a statement at that time showing how much of that $2,000,000 was applicable to 1924, 1925, 1926 and 1927. That study was not made available to the defendants in connection with the statements concerning the extraordinary depreciation and other depreciation; it was an entirely different subject. I could not say whether

1948 that study is in Chicago now or not, but it will be made available for inspection by defendants if it is in existence. I can give the division of the amount.

I stated that the net earnings on the non-Bell business for the years 1923 to 1931, inclusive, were 11.3 per cent, and when asked if that figure included all profits on sales of telephone apparatus to non-Bell customers, I said that it did. These figures include the entire profit on the sales of the Western Electric to its non-Bell customers. Prior to 1925, these customers were the ultimate users, and, subsequent to 1925,

1949 they were the Graybar Company and the Electrical Research Products and its distributors. The 11.3 per cent does not include any portion of the profits of the Graybar

Company, or of the International Western Electric Company, or of the Electrical Research Products, or of the Northern Electric Company.

I furnished defendants a document entitled "Depreciation expense included in cost of plant made, 1916 to 1931, inclusive".

(Which said document was marked for identification as Defendants' Exhibit D-86.)

This exhibit shows that $3,000,000 was included as depreciation expense in the cost of plant made by the Western Electric Company during that period, and that $2,176,- 1950 000 was included for the period 1923 to 1931. It also shows that during the period 1916 to 1931 there was $72,000,000 of plant made by the Manufacturing Department, and for the period 1923 to 1931, $54,000,000 of plant was made by the Manufacturing Department. The $3,000,000 is determined by a study of the probable amount included; it 1951 had to be an approximation. We did not have any rates and the study was made in New York while I have been out here, so I am not familiar with the exact method by which it was done.

We do not think it necessary at all to determine the amount of depreciation expense that goes into cost of plant, because we feel that the cost is entirely reasonable and that by manufacturing our own plant we are getting those facilities at a considerably lower price than we would if we bought them from outside sources. We did, however, include as one 1952 item of cost of plant depreciation expense. The study as to the amount included in the cost was not made by me, and I am not in a position to say how it was made. I do not think that a study has ever been made before this one, which was made up specially to give to the defendants.

We know that depreciation expense is included in the cost of plant, because machinery, buildings and service equipment, which are manufactured in our plant, carry a pro rata share of the load of the plant, and the load or burden of the plant includes depreciation. I cannot say if, when it is contemplated to make an item of plant, there is a cost study showing

the probable cost of that item. I presume that items of plant are manufactured on the basis of a cost study, but I have never inquired into it.

I furnished the defendants the two sheets identified as Defendants' Exhibits D-87 and D-88.

1953 "Mr. Goldstein: Q. 'Total 1929 average investment Bell and non-Bell business, on percentage, apportioned on basis of standard cost of sales'?

"A. Yes.

"Q. I notice a footnote, 'Apportioned on the basis of sales'. Is that intended to be also different than the heading 'Cost of sales'?

"A. That applies to the item Receivables, and applies only to 5 per cent of the receivables. In other words, there are certain miscellaneous receivables of varying nature which are included there which have to be apportioned on some basis. They are not directly allocable, and we have used the basis of sales in that case."

When I say "basis of sales", I do not mean on the basis of the cost of sales, but the basis of sales.

1954 Arthur Young and Company have made yearly audits of the books of the Western Electric Company for the last four or five years. The only official certificate of Arthur Young and Company in each year is the certificate appearing in each of the annual reports of the Company. We have 1955 not asked for any certificate other than those. Arthur Young and Company have made other audits for us, in connection with special conditions, that we asked them to do, but the only audit, so far as the balance sheet and income statement as a whole is concerned, is covered by their certificate in the annual report.

The rental for the space occupied by the Western Electric Company at 195 Broadway is paid on the basis of the charges made by the 195 Broadway and 205 Broadway Corpo- 1956 rations; it is on a per square foot basis, and is made currently. The amount paid per square foot for any year depends upon the operating charges of the building. I think there is included a modest item of return on investment,

but I am not sure about that; those are details that I have not looked into for some time.

"Q. I understood you to say somewhere in the testimony here that you paid a portion of the operating expenses, and a certain per cent on the stock, as a part of your rent?

"A. I think you are mistaken.

"Mr. Thompson: Mr. Goldstein—

"A. I do not think I testified at all on that.

"Mr. Thompson: No.

"A. That is an entirely new subject to me.

1957 "Mr. Goldstein: Q. You also testified about space that you rented to the New York Telephone Company.

"A. Well,—

"Q. (Continuing) At 395 Hudson, is that correct?

"A. I might have testified that we owned the 395 Hudson Corporation in conjunction with the New York Telephone Company, but I do not recall any testimony that I have given with reference to rent charges.

"Q. Did you testify—did you base any of your rentals on the basis of getting back a proportion of the operating expense and interest at 7 per cent on the stock?

"A. I know that is the case."

1958 The 395 Hudson Corporation is a real estate corporation formed to construct and own the building, and it must get a return on its investment. That investment consists of stock, notes payable, and a 5 per cent mortgage, and the rent rates must be sufficient to pay the interest on the mortgage, the interest on the notes, and a fair return on the capital invested, on the stock.

"Q. And you figured that at 7 per cent, as I understood the testimony?

"A. Well, I don't recall testifying to that.

"Mr. Thompson: I don't think there was any testimony about that.

"Mr. Goldstein: Well, I will find out.

"Q. But the basis of it is as you described?

"A. Yes.

"Q. All right.

"A. That would be the fact, it is either 6 or 7 per cent.

"Q. Yes.

"A. I don't recall which."

(Copies of the resolutions of the Board of Directors for the years 1925, 1926, 1927, and 1928, authorizing the extraordinary depreciation, together with a document
1959 used in connection with the determination for each of those years, were identified as Defendants' Exhibits D-89 and D-90, respectively.)

These documents were furnished by me to the defendants, and contain all the data of which I know pertaining to that subject matter.

(Document entitled "Orders on hand December 31", pertaining to the years 1916 to 1926, marked for identification as Defendants' Exhibit D-91.)

We have not readily available corresponding data to that contained in Exhibit D-91 for the years since 1926. We did not file that information after 1926.

1960 "Q. Mr. Gregory, you testified on about June 17-19, 1931, in a case entitled 'In the matter of the Investigation and Inquiry of The Public Utilities Commission of Ohio, upon its own motion, of the Ohio Bell Telephone Company'.

"A. Yes, sir.

"Q. In connection with that testimony, I read you the questions and answers from the transcript which was furnished to us. I will ask you whether these questions were asked of you, and whether you made the following answers:

"Mr. Thompson: Are these questions in impeachment? Is that their purpose?

"Judge Wilkerson: Well, of course, obviously, it is the only purpose it could have; it must be. I assume that is the purpose.

"Mr. Thompson: I just wanted to inquire.

"Mr. Goldstein: Yes.

"Q. The question was: 'I believe you testified that your own prices are going up due to the depression, is that correct?

1961 'A. You mean our prices of materials?

'Q. Of materials, yes.

'A. Yes, sir, our prices have gone up because of the fact, to some extent, because of the fact that during the ten year period, we have reduced prices to too large an extent while other companies were increasing their prices with increased volume of business, we were decreasing our prices, and we decreased our prices in 1929 to a very large extent, not realizing that the depression was ahead of us.'

"Judge Wilkerson: How are you going to impeach the witness with stuff of that character?

"Mr. Thompson: Yes.

"Mr. Goldstein: It is next.

'In 1926 and 1927, you set aside an eight million dollar depreciation in anticipation of a construction program which hadn't yet been commenced, but which was to be written off in 1931 and 1940, and in 1929 you reduced prices, not anticipating the depression?

1962 'A. They are two entirely different things, Mr. Herbert. In 1929, as far as prices to the associated companies are concerned, we felt in every year as we did in 1929, that we should make such reductions in prices to the associated companies as we could and still maintain a fair return on the investment. As far as prices are concerned, we felt that if the depression comes and if there is a demand for increase in prices, as we have reduced, so in fairness, we could increase the prices. But when it comes to the construction of plant, this is not a reserve against construction of plant in 1931 to '40. It is a write-off, it is a reserve against a write-off which we may be forced to make on plant that has already been constructed from 1918 subsequent to the war up to the present time, the cost of which we feel should be apportioned and charged against that period rather than against the period in 1931 to 1940, which it seems pretty evident is not going to be as active years as have been in the last ten years.'

"Did you make those statements, and those answers?

"Mr. Thompson: Of course, it is not impeaching, but 1963 we have no objection whatever.

"Mr. Goldstein: All right.

"Q. Did you make those?

"A. I certainly did.

"Judge Wilkerson: Let the stenographers copy the report into the record by agreement."

I think that the Western Electric warehouses carry some stock for the Long Lines Department, but I am not entirely familiar with that subject, as it comes entirely under the Telephone Sales Department. I do not know whether the Long Lines Department has a warehouse.

Note: Witness pointed out that wherever in his testimony he spoke of the spread over the Bell and non-Bell business according to the standard cost of each class, he meant to testify that this was done in general according to the standard cost of each class of apparatus; that is, telephone apparatus, cable and supplies separately.

1965 F. O. HALE, witness on behalf of the plaintiff, having been previously duly sworn, resumed the stand and testified further as follows:

Cross-Examination by Mr. Haight.

March 24, 1932.

I have had no experience with a decrease in rates in Chicago but I have had the equivalent, that is, experience with lower rates. There has been no decrease in local exchange rates in Chicago during my connection with the Company.

My opinions were based on my general experience in the 1966 telephone business of twenty-eight years, on the history of the Company and its experience with the lower rates which have been in effect here in Chicago.

The service with lower rates, which I had in mind as the experience upon which I partly based my opinion, is the four-party coin box service; from 1912 or 1913, or somewhere in that neighborhood, up until 1921 there was a four-party coin

box rate on which the guarantee was $1.50 a month and the message usage included in that guarantee was thirty messages a month, or a call a day. There was no decrease in that rate. There was a guarantee of $1.50 a month and a message usage of thirty messages a month, which resulted in an average usage
by the four-party coin box subscribers under that rate
1967 of 33.6 or 34 messages per month. That rate was in effect for several years and in 1921 the present rate was made effective. The present rate calls for a guarantee of substantially $2.75 a month with fifty-five message usage allowed under it. The rate in effect prior to the present rate was the one to which I referred, that is, the guarantee of $1.50 with an allowance of thirty messages under that guarantee.

I have not been calling attention to any decrease in rates; I am calling attention to a rate that was previously in effect.
The change made in that rate was an increase up to the
1968 present rate. With that increased rate the average usage went from substantially thirty-four messages to forty-six messages; the message usage increased under the higher rate due to the increase in guarantee.

In speaking of residence coin box service, I gave it as my opinion that the decrease in rate in question here would bring in some ten or twelve thousand additional users. I based that estimate on my judgment and experience as to what that decrease in rate would produce in the way of additional users. I took into account the present high development that exists in Chicago. I also took into account that that appeal would merely be to marginal users who were counting the cost of service and whose need of service was necessarily somewhat less than the present average user, otherwise they would be users now.

My general opinion would take into account the spe-
1969 cific experience I have gained in the telephone business during twenty-eight years. I did not have in mind any specific analogy. I took into account the facts as to telephone

development here; I took into account the type of user it would appeal to and formed an opinion as to the additional number of subscribers we could expect to get with that reduction in the guarantee.

The four-party coin box service, generally speaking, appeals to the marginal users; that is, to the people to whom the rate is important and to whom the grade of service is
1970 not the controlling factor. There are a lot of users who are interested only in inward service; they have very little need for outward service. They take the cheapest grade of service because they can get it the cheapest that way. There are many railroad men who have to be called that way; many workers, such as scrub women and wash women who are called out for specific jobs. In many cases, it is their means of getting hold of a job.

The people who I have just indicated are not illustrative of the kind of folks who use that service. There are many people who use the service who are not in that class.

Those who use the two-party residence service are, generally speaking, a class to whom the quality of telephone service means more and price means less. There are some working people who use this service if they feel they can afford it.

Those who use the one-party business coin box are, generally speaking, the business people whose needs for telephone service are relatively light. In many cases, the character
1971 of their business brings many outsiders into their offices and they want a coin box so that when such outsiders come in and say they want to use the telephone they have an easy way of saying, "There it is," and the outsider pays for his own call.

The two-party business coin box users are of the same general type, but are, ordinarily, a poorer grade of business users; the man to whom the amount of money for which he is obligating himself means more and to whom the quality of service is not so important as to cause him to feel justified in taking a one-party line.

In my direct examination, I stated that the full effect of the

reduction, in so far as the obtaining of new subscribers
1972 was concerned, would not become fully operative for
about two years. This reduced rate would attract a certain number of additional subscribers, but before it had become sufficiently generally known and before the full number of users I thought might be attracted to it had been attracted, approximately two years would elapse; approximately two years would be necessary for all of them to have taken the service. I think the users in that class of service would have increased as general telephone use increased during the years beginning with 1923 and up to 1929, but I do not think that
they would have increased any since 1929.
1973 Any effect in lowering the loss in subscribers by reason of the decreased rate is contained in the estimate of increased use I gave when I said the increased number of subscribers would have been ten or twelve thousand. I think that that would have been the limit of the additional subscribers who would have been attracted by the lower rate fixed by the Commission.

The fact that the population of Chicago has increased from 1923 has had an effect upon the number of subscribers we have, but that effect is there all the time and has nothing to do with this reduction in rate. The effect of the increased population had the rate been lowered would only have been by the additional number of people who would have been appealed to by that lower rate of forty-six cents.

The subscribers in the four-party residence class are
1974 going out of that class into the two-party residence coin
box class if we can persuade them to. We do attempt to persuade them to do that.

If we had a lower rate for the four-party coin box service, I do not think that the subscribers who have a higher class of service instead of discontinuing their telephones would have continued in the four-party class; at least, this would have only been true so far as it is covered by this additional ten or twelve thousand stations. That covers all the additional stations that, in my opinion, we would have obtained from the

lower rate wherever they came from, whether they came from non-users or from people who dropped back.

Economic factors have a bearing on inducing people
1975 to keep telephones.

In my direct examination, I said that the gross revenue which we would obtain from these ten or twelve thousand users would not amount to over $28.00 a year per tele-
1976 phone. I based that on the fact that only the marginal users would be attracted by that reduction in the guarantee. The guarantee as reduced would amount to $27.37 per year. Now, these additional users are marginal users and I do not think that the few months in which some of those would run above the guarantee would raise the average revenue from those stations over $28.00 a year. I have no details of that estimate. It is based entirely with reference to guarantee. It should be borne in mind in that connection that under the present rate we have some 65 per cent of the users who do not use up to the present guarantee and we have a lot of people whose use would be away under the new guarantee.

The study upon which I based the conclusion that 65 per cent of the users use under the present guarantee is based on a study of usage made in 1928. That study consisted of a selection of certain subscribers by lot. We obtained the usage
1977 each month for a period of a year for those subscribers distributed throughout the city and, of course, kept a record of that usage. We made a determination as to the percentages of that group having varying usages in steps of 5 up to 200 and in steps of 10 above 200. This study covered the four-party coin box service. I could not say whether there was any other class of service included in it. We made a similar study of the four-party coin box service in the years 1913, 1914 and 1915, when this thirty message $1.50 guarantee was in effect.

In coming to my opinions given in my direct examination, I was familiar with both the study of 1913 and 1928.
1978 I used the study of 1928 to the extent of knowing that 65 per cent of the present coin box users were using less

than the guarantee. Save for that, that study would not have any bearing on the question, in my judgment, and I did not use it.

In my direct examination, I said that the estimated net telephone revenue would not exceed 10 per cent of the gross revenue of $28.00 a station. I was talking about additional subscribers attracted by the decreased rate whose usage would amount to $28.00 a year.

1979 I have no further details upon which I based my estimate other than those I have given. The figures in this case show that the net telephone revenue is 15 per cent of the gross revenue; that is the average of existing stations. It is likewise a fact that the existing stations produced an average revenue of about $54.00 during the period covered by this case, that is, from 1923 on. So far as these additional stations that would be attracted by this lower rate are concerned, the usage would not be over $28.00. Accordingly, I said that these stations could not produce a net revenue of more than 10 per cent of the gross they produced and I had some doubt whether they would produce any net revenue.

Perhaps 15 per cent net revenue is not strictly accurate;—it ran, as I remember it, over the period from 1923 on, from 15 to 16.5 or something like that. That average of 15

1980 or 16 per cent of net revenue is for all kinds of subscribers. I mean that the net revenue was 15 or 16 per cent of the gross revenue; this is called net telephone revenue, which is a technical term and is after the deduction of taxes and after the deduction of depreciation and before the deduction of interest and before taking into account sundry net earnings. It is net telephone revenue from telephone operations. It is, broadly speaking, the gross less the cost of conducting those telephone operations.

1981 The tendency is to increase the number of customers if the rate is lower. The message use depends upon the number of messages allowed under the minimum rate the subscriber must pay. The decrease of the rate per message has very little effect upon the usage of the service; it is the

number of messages allowed under the guarantee that is the controlling factor.

1982 So far as the business subscriber is concerned, it is rather self-evident that he uses all the service he would use under the lower rate per message. The telephone is an important instrumentality in carrying on his business and he would naturally use it to the extent to which it did him good and helped his business along. The rate may tend to eliminate some non-essential business, such as calls made by his clerks and his help if he allowed them to use the telephone, but so far as his needs are concerned I believe they are usually controlling.

"Q. Well, don't you think that if the delicatessen owner wishing to buy both goose livers and frankfurters had a low rate, he might order each one as he thought of them, but with a high rate, he may be so thoughtful as to telephone only once for the two?

"A. If he could get them both from the same place, possibly that is true."

1983 Service to an individual subscriber becomes more valuable as the total number of people he can reach increases. In certain individual cases the addition of the ten or twelve thousand four-party subscribers would result in the origination of additional calls for these subscribers from other subscribers in the exchange; but it probably won't raise the average calling rate. I know that because we have been growing here in Chicago for many years and our average calling rate remains fairly constant; it varies with business conditions somewhat because of the business influence.

Every call that is made has to terminate somewhere. An individual telephone will not have about as many out-
1984 going as incoming calls. For instance, in this four-party classification I was talking about a short time ago. Some of the subscribers of this service do not use 10 outward calls and we do not know how many inward calls they get; they may get 30 or 40 inward calls. I do not think it is true as to the individual telephone that the incoming calls will

about equal the outgoing calls. Each call out of an exchange area has to have a place to terminate; that is, if it is made, somebody answers and it terminates on some telephone. But as to an individual telephone, it is not true that the outgoing and incoming calls are about equal.

The calling rate is the average number of originating calls per station. I have not the figures in mind as to what this calling rate was from 1923 until the present time. It possibly went up in some years and in some years it went down, but, on the average, it has not changed very much. I think
1985 that as the exchange has grown the calling rate in recent years probably was not as high as it was back in 1915 or 1916. That may seem to go directly contrary to our statement that there is added value in added stations but that added value comes only to those stations who want to call this added station and we do not know who it is going to be. We do not know when we are going to call one of these stations that may have been added, but it is a great convenience when it is there and we can call it when we want to.

Without consideration of the individual telephone, these ten or twelve thousand additional stations, as a whole, would have to have the effect of increasing the number of incoming calls within the exchange to about the same extent that it would increase the number of originating calls, because every call these stations originate would have to be an incoming call somewhere. This would not mean an increase in exchange revenue per station, nor do I think it would be a substan-
1986 tial increase in exchange revenue. It would not be an increase in net revenue. I estimated that the net revenue might possibly be increased by $30,000. I said further that that $30,000 would probably reduce our average net earnings on plant; that would be its tendency. It might be infinitesimal, but if these additional stations did not earn as much on the average as the existing stations did on the average, the tendency would be reduce that average rate of return. These additional stations would have to have plant to go with them and operating expense to go with them. They might not be in sufficient number to be of a serious amount.

I have been talking about the general effect of adding these ten or twelve thousand stations. These additional stations would receive incoming calls and I took that fact into consideration in my direct examination. They certainly would receive incoming calls.

1987 "Q. And in respect to that, do you figure that the incoming calls will about equal the outgoing calls?

"A. To that particular group of stations?

"Q. Yes.

"A. Perhaps a group of ten or twelve thousand, it would tend to equalize. I think we would have in this particular ten or twelve thousand marginal users a proportionately large number of people who wanted the telephone service for the sake of getting inward calls."

I call them marginal users because of the particular rate and cost, because if the rate was any more they could not stay; that is the general idea.

1988 The tendency is that if the rate goes down it would attract more and more subscribers. It probably would, but we would not be giving telephone service at a lower rate than we have been talking about.

Speaking of the four-party residence coin box service, the additional revenue, when there is taken into account incoming and outgoing calls in respect to those ten or twelve thousand stations, would not produce a net profit greater than the 15 or 16 per cent attributed to the exchange revenue. I have already said that the tendency would be to reduce that

1989 15 per cent as a return. The addition of these stations would carry with it the plant that was necessary to serve them, the operating expense and maintenance for them and everything else that goes with it.

Our exhibits as to the rates proposed by the Commission show that the guarantee would amount to $27.37 per annum. There is nothing there for messages originated with other stations that are incoming to these ten or twelve thousand stations because a great deal of their incoming calls would come right from within the group, and a great many would come from users already in that service who are using less

than the guarantee and for which we would get nothing. I do not think there would be anything added. As a practical matter I would allow nothing for the messages originat-
1990 ing with other stations incoming to these ten or twelve thousand additional stations. I am not saying that there would not be an occasional call, but I am saying that as the number of subscribers has grown our average calling rate does not go up, so there could not be anything added.

To a very slight extent, some of these ten or twelve thousand four-party subscribers are potential toll users. I did not consider that in my estimate, because I assumed that for their toll service they have been going to a pay station and getting their toll service. When people have no telephone of their own and have need for toll service, I think they get it from a public station. If these ten or twelve thousand addi-
1991 tional subscribers were to have telephones, they would use their own telephone for toll use, but it would not increase the total toll use any. In effect, I think we are getting their toll traffic now. I do not consider these additional subscribers as potential additional toll users at all. The fact that they have telephones upon their own premises might have a slight tendency to increase their use of toll service, but not enough to affect materially this problem.

These additional stations would probably not increase incoming toll calls. I assume that if there is need to call these people now, they have been called and messengers have been sent to call them to a telephone, and the call has been made. As far as any material effect is concerned, I think that is true.

"Q. In any event, you did not take that into consideration, whatever it may amount to, in arriving at your estimate?
1992 "A. No, because in my judgment it does not affect the proposition."

I cannot say positively whether the Company, in the regular course of business or otherwise, made any estimate of the annual revenue effect on account of the change of rates upon regular forms, such as those shown me by counsel for the defendants. I can say this, that as soon as the Commission

order came down we became very much interested in what the revenue effect would be. I am not familiar with the form shown me by the counsel for the defendants nor whether that form was used in 1923 or 1924. I think I have seen the form, and it is probably used, but I could not identify it.

1993 A pamphlet handed me by counsel for the defendants is a copy of an address given by me before the Mid-day Luncheon Club at Springfield, Illinois, April 2, 1931, entitled "The Telephone Company as a Citizen of Your Community".

(Which said document was marked for identification as Defendants' Exhibit D-92.)

I think that economic conditions are a very considerable factor in respect to the changes in calling rates.

There is no minimum guarantee for toll and long distance rates.

"Mr. Thompson: Your Honor, during the course of 1994 Mr. Gregory's examination we had identified Exhibits A-70 to A-98, inclusive, A-109 and A-110. I think most of the exhibits were offered in evidence, and there was an agreement with Mr. Haight that they could make their objection at the end of the testimony.

"We now offer all of these exhibits, and each of them separately.

"Mr. Haight: If the Court please, we object to the admission of Exhibits A-77, 78, 79 and 80, being respectively, 'Sales, Net Profits and Average Investment, Bell Business, 1916 to 1930, inclusive, (Dollars in Thousands)', 'Sales, Net Profits and Average Investment Bell Business 1916 to 1931 Inclusive', 'Sales, Net Profits and Average Investment—Non-Bell Business 1916 to 1930, Inclusive', and 'Sales, Net Profits and Average Investment—Non-Bell Business, 1916 to 1931, Inclusive'.

"And also Exhibits A-93—I think it will not be necessary to read their titles,—I will just give their identifying numbers —A-93, A-94, A-95, A-96, A-97 and A-98, and A-110. The first ground of the objection is that each of these 1995 exhibits is either in whole or in part based upon and uses the pension fund accruals as items of expense, and

no foundation has been established for pension fund charges against earnings.

"And also in respect to each year involved, each of these exhibits makes use of both Bell and non-Bell earnings, and also in expenses, with reference to Bell and non-Bell investment. These have not been properly segregated, and consequently there is no proper foundation for the introduction of those, on that ground.

"And, furthermore, in respect to each of the years involved, there has been no foundation laid or no proper showing made as to what the investment is, or what the earnings are in each of those years.

"Mr. Thompson: I think, your Honor, that the first objection, that is, that there has been no basis laid for the pension fund expense, which constitutes a part of the expenses included in these exhibits, does not go to the competency or admissibility of these exhibits. It is one of the expenses of the company. The comptroller has testified.

"Judge Wilkerson: In the end, we will have to decide whether it is a proper expense. If it is, the exhibit is the basis for the allowance of the expense. If it is not a proper 1996 expense, it will be rejected.

"Mr. Thompson: Exactly. And as we have already said, your Honor, it is our intention to put someone on on that; but I am not making as a point that the admissibility of the exhibits depends upon further testimony of that character.

"Judge Wilkerson: Where computations of this kind are offered in evidence in a case tried by the court, they are usually admitted. The objection goes to the weight of the exhibit rather than to its admissibility in evidence, and in view of the way in which the evidence in this case is being heard, the court will be liberal in ruling on exhibits offered by both sides. Any exhibit which plainly has no weight in the case will not, of course, affect the judgment of the three judges who hear the evidence.

"The objection is overruled."

Defendants except.

(Which said documents, so offered and received in evidence, were marked Plaintiff's Exhibits A-70 to A-98, both inclusive, and A-109 and A-110.)

May 9, 1932.

1999 "Mr. Goldstein: If the Court please, I would like the record to show that we desire to press our motion to strike Exhibit A-99, which is based on—which the record shows is based on the Bell Telephone Securities Manual, which is turn is based on M. R. 1 and 2, access to which exhibits we were denied by the Court's ruling on our motion; also Exhibit A-100, based on—

2002 "Judge Wilkerson: He is making the motion. Let the record show the motion, and then we will consider it later.

"Mr. Goldstein: Also Exhibit A-100, Exhibit A-103, Exhibit A-105, and Exhibit A-108; and the testimony of Mr. Crunden, and the testimony of Mr. Gherardi, which is based upon these exhibits; we desire to press our motion heretofore made, and desire to state for the record that we have not been able to get together with counsel on any method of examining these records.

"Mr. Thompson: Mr. Goldstein, these records that you are referring to now are in the office of the Illinois Bell, where you were permitted to inspect them. Is that not correct?

"Mr. Goldstein: No, sir, it is not correct. I was told to go over to the Illinois Bell, and I went with a representative of the Illinois Commerce Commission, and I was told that I could direct my eyes on a certain line; that I could not examine any exhibits, that I could not touch any exhibits, but I would have to look at a line that was checked with a pencil mark. I stated that I would refuse to look at them under those circumstances.

"Mr. Thompson: These exhibits are open to Mr.
2003 Goldstein's inspection at the offices of the Illinois Bell, and I understand that his purpose and desire was to withdraw them because they contained a large variety of information not at all related—

"Mr. Goldstein: There was nothing—

"Mr. Thompson: (Continuing)—to the subject-matter of Mr. Crunden's testimony.

"Mr. Goldstein: There was nothing said about withdrawing them whatsoever.

"Judge Wilkerson: Well now,—

"Mr. Goldstein: If they are not to be made accessible, we desire to have them produced here, so that we can look at them, under some order of court.

2004 "Mr. Blackman: Your Honor, as to this, may I say this one word: These documents that Mr. Crunden referred to as the basis of his testimony, were documents that were prepared in the regular course of business by the American Company. I think that they themselves would be sufficient foundation for his testimony, being prepared in the regular course of business, bringing together the information from many different sources, and compiling these figures.

"Now what Mr. Goldstein asks is to see the figures that underlie, the separate figures; that is, he wants to see some 350 different figures that have been compiled to make these figures that appear on the compilations prepared by the American Telephone & Telegraph Company. These compilations are the only compilations that the American Telephone & Telegraph Company itself makes up; they are the first

2005 figures which it prepared. Now, it does have, as we stated on the record before, the separate reports of each of the individual companies, and it goes to those reports and picks off these figures.

"Now as we stated from the outset, there is no objection to the defendants examining those reports, as to any of the matters which we have used, but there are comparisons there, the reports are quite voluminous, they contain a great deal of matter which is of no real interest to the defendants in this case.

2006 "Judge Wilkerson: You may bring them in, yes.

"Mr. Blackman: —and the defendants—

"Judge Wilkerson: I will let you do it in the presence of the clerk, and let Mr. O'Sullivan preside at the inspection.

"Mr. Goldstein: That is all right.

"Mr. Haight: That is satisfactory."

IN THE

District Court of the United States

FOR THE NORTHERN DISTRICT OF ILLINOIS,

EASTERN DIVISION.

ILLINOIS BELL TELEPHONE COMPANY,
Plaintiff,

vs.

G. GALE GILBERT, J. PAUL KUHN, WALTER H. WILSON, WILLIAM M. BRINKMAN, PHIL W. COLLINS and PAUL SAMUELL, the persons constituting the Illinois Commerce Commission of the State of Illinois, and OSCAR E. CARLSTROM, Attorney General of the State of Illinois,
Defendants,

and

CITY OF CHICAGO, a municipal corporation,
Intervenor.

In Equity
No. 8746.

Heard before
Hon. Evan A. Evans
Hon. George T. Page
Circuit Judges
and
Hon. James H. Wilkerson
District Judge.

ABSTRACT OF RECORD

PLAINTIFF'S EVIDENCE

VOLUME III—(Pages 607 to 1048)

WILLIAM H. SEXTON,
Corporation Counsel, City of Chicago.

GEORGE I. HAIGHT, and
BENJAMIN F. GOLDSTEIN, and
EDMUND D. ADCOCK,
On behalf of City of Chicago,
Intervenor.

OSCAR E. CARLSTROM,
Attorney General of Illinois,
and
WILLIAM C. CLAUSEN,
Assistant Attorney General,
On behalf of Illinois Commerce Commission.

CHARLES M. BRACELEN,
WILLIAM H. THOMPSON,
KENNETH F. BURGESS,
EDWARD L. BLACKMAN,
On behalf of Plaintiff.

HORACE KENT TENNEY,
LESLIE N. JONES,
Of Counsel.

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Defendants,

and

CITY OF CHICAGO, a municipal corporation,
Intervenor.

In Equity
No. 3746.

Heard before
Hon. Evan A. Evans,
Hon. George T. Page
Circuit Judges
and
Hon. James H. Wilkerson
District Judge.

ABSTRACT OF RECORD

Plaintiff's Evidence

Volume III—(Pages 607 to 1048)

ALLAN B. CRUNDEN, recalled as a witness on behalf of the plaintiff, having been previously duly sworn, further testified as follows:

2007 *Direct Examination by Mr. Blackman.*

May 9, 1932.

I prepared the sheet which purports to show the per cent that the Long Lines Department is of the total associated operating companies (including the Long Lines Department itself and the Bell Telephone Company of Canada), with relation to certain factors, namely, exchange and toll lines, central office equipment, and plant in service less land and buildings, all for the years 1923 to 1931, and plant in service as of June 30, 1931. I prepared this at the request of Dr. Jewett to furnish him the ratio shown on the last column. The sources from which I obtained the figures shown are indicated at the foot of the exhibit. I prepared it from the Comptroller's report containing those figures and from some monthly reports of the Long Lines and the Bell Telephone Company of Canada. The figures which appear on my
2008 Exhibits 99, 100, and 101, came from these same documents.

(Sheet was offered in evidence as Plaintiff's Exhibit A-111. Ruling on admission was reserved until the close of the cross-examination.)

I prepared the sheet purporting to show the ratio of certain figures for the Chicago area to the corresponding figures for the total associated operating companies, excluding the Long Lines but including the Bell Telephone Company of Canada. The matters covered are exchange and toll lines, central office equipment, and plant in service less land and buildings, all for the years 1923 to 1931, and plant in service and company stations for June 30, 1931, only. I prepared this
2009 similarly at the request of Dr. Jewett, and the sources of the information are the same as for Exhibits 100 and 101; the sources are indicated at the foot of the statement.

This paper and the other one which I have referred to were correctly prepared, and, I believe, are entirely correct.

(Said document was thereupon marked for identification as Plaintiff's Exhibit A-112.)

I prepared the paper purporting to show the ratio of plant in service of the Chicago area to the plant in service of the total associated operating companies, including the Long Lines and the Bell Telephone Company of Canada, for the years 1923 to 1931, inclusive. I prepared this at the
2010 request of Dr. Jewett. It is correctly prepared and correctly sets forth what it purports to show. The figures in this document were obtained from Exhibits 100 and 101, with the exception of the percentages in the third column, which are computed from the figures shown in the preceding column.

(Said document was offered in evidence as Plaintiff's Exhibit A-113.)

Cross-Examination by Mr. Goldstein.

Exhibits A-111, A-112 and A-113 were prepared subsequent to the hearings in the Ohio case and were never presented in that case.

The source of the information for Exhibit A-111 for total associated operating companies is C. R. 64-A, which in
2011 turn is based upon M. R. 6. The source of the information for Exhibit A-112 is M. R. 1 and 1-A.

In taking the central office equipment of the associated companies on, for example, A-111, I assumed it is central office equipment; I have taken a certain account. I
2012 have not testified regarding the character of use of the items found in the account. My exhibit depends upon the fact that certain equipment is included by definition in a certain account of the Interstate Commerce Commission's system and the computation is purely mathematical. The definition of the Interstate Commerce Commission does not appear on the M. R. reports from which I took the information. It is not correct that the M. R. reports state that the

compilation is not in accordance with the classification under the Interstate Commerce Commission rules.

2013 Monthly Report No. 1, identified as Defendants' Deposition Exhibit 79, states "these figures on this report are not arranged in exact accordance with the book accounts prescribed by the Interstate Commerce Commission and this fact should be recognized in quoting and using them".

That has nothing to do with the central office equipment, however. The central office equipment figures, as well as all the other figures in these exhibits, are merely the figures shown opposite certain wording for each of the accounts on these sheets. These sheets do not contain any definitions of the Interstate Commerce Commission.

(Defendants move to strike out the exhibits on the ground that the underlying records from which they are
2014 compiled were not made available to them and had been refused to them. Ruling on motion was reserved.)

Re-direct Examination by Mr. Blackman.

The phrase standing at the head of that paper referred to in my cross-examination had reference to the fact that Monthly Report No. 1 contains a section entitled "Earnings and Expenses", and in that section the revenues and expense and net earning items are shown in a form which was adopted by the Bell System prior to the issuance of the uniform system of accounts of the Interstate Commerce Commission. For convenience of comparison, this particular report has been carried along in the form which was in use prior to 1913,
when the Interstate Commerce Commission system took
2015 effect. There is nothing in here which is out of line with the uniform system, but it is simply a slightly different arrangement of the items, and a slight difference in terms. For example, the Interstate Commerce Commission uses the term "gross income" as meaning substantially what is referred to on this report as net earnings.

The changes, whatever they may be from the Interstate Commerce Commission classification, have no bearing at all on any of the figures which I have used.

Re-cross Examination by Mr. Goldstein.

This same report on which that statement is made also contains a condensed summary of the balance sheets.

The notation that the figures on this report are not arranged in exact accordance with the book accounts prescribed by the Interstate Commerce Commission and this fact should be recognized in using them and quoting them, refers primarily to the revenues and expenses. My conclusion that it refers primarily to that is not based upon anything found on the sheet, but it is based on our knowledge as to why we continued that for use. The only way you could determine that the asset items are in accordance with the Interstate Commerce Commission's rules is by checking back these reports against the reports of the companies to the Interstate Commerce Commission. Without that there is no way you could determine whether the items of assets on these sheets are in accordance with the accounts of the Interstate Commerce Commission if you fail to be satisfied that these are correct reports in themselves. They are reports made in the regular conduct of business. Without that assumption there is no way you can tell, without that analysis.

Re-direct Examination (Continued) by Mr. Blackman.

The designation in the telephone company of the paper referred to as bearing the legend at its top "This does not conform to the Interstate Commerce Commission's requirements" is C. R. 51-A.

In connection with Exhibits A-111, A-112 and A-113, I have not used any part of that report, as to any assets.

No part of these asset figures shown on that paper were used in connection with my previous exhibits.

My statement in answer to Mr. Goldstein, that it would be necessary to see these individual reports in order to check the asset figures on those sheets, would have nothing to do with checking any figure which you used in this case. That statement is true, but it is not relevant, because I did not use

that report. I used C. R. 64-A, which is a report that
2020 has been submitted to the defendants.

The accounts and figures on that report are in exact order in accordance with the reports to the Interstate Commerce Commission.

Re-cross Examination by Mr. Goldstein.

64-A and 51-A cover the same assets. They represent the same items and are then computed in the same manner.

2021 FRANK B. JEWETT, called as a witness on behalf of the plaintiff, having been first duly sworn, was examined and testified as follows:

Direct Examination by Mr. Blackman.

May 9, 1932.

My name is Frank B. Jewett. I reside at Short Hills, New Jersey. I am Vice President of the American Telephone and Telegraph Company, and President of the Bell Telephone Laboratories, which position I have held since January 1, 1925. As Vice President of the American Telephone and Telegraph Company, I am responsible executive in charge of all of the development and research activities of that company, and of the Bell System. As President of the Bell Telephone Laboratories, I am the chief executive officer of that organization, which is the part of the Bell System in which the work of experimentation and physical and chemical research
2022 is carried out.

These two departments are in effect part of a single organization, the duties of which are to conduct fundamental research in the field of electrical communication; to conduct more specific research looking to the application of fundamental knowledge, whether obtained as a result of our work or from outside sources, to the end of producing improved instrumentalities for the giving of electrical communication

services. In addition to that, the Department of Development and Research sets the general requirements to be met by new equipment, apparatus or circuits, and is the final judge as to whether the things produced meet those requirements. The requirements which we set for material to be developed and furnished, developed by the Laboratories or by others, are determined from our general knowledge in the communication field, and from our contacts with the operating units of the Bell System, either directly or through the Department of Operation and Engineering.

2023 In addition, it is our function, when new equipment has been developed and standardized, to prepare the fundamental requirements for its installation, operation and maintenance. That information is furnished to the operating units in the form of bulletins or circulars. It is the function of the Bell Laboratories at the same time to furnish to the manufacturer, the Western Electric Company, or whoever it is that is to manufacture, the requirements for the manufacture of that sort of material, in so far as requirements are required, and to check the product before it is put into the telephone plant. Further, the Bell Laboratories is the ultimate judge of whether the material to be furnished to the operating units of the Bell System meets the specifications which have been set.

The requirements, standards and specifications to which I have referred are standards, requirements and specifications for a number of things to be used in the plant of the Bell System.

2024 My primary education was in California, where I received in 1898 the degree of Bachelor of Arts in Electrical Engineering, from what is now the California Institute of Technology, then called Throop Polytechnic Institute. From 1898 to the spring or summer of 1902, I was a graduate student of the University of Chicago, and was research assistant to Professor Michelson during the latter part of that time. In 1902, I received my degree of Doctor of Philosophy in Physics and Mathematics at the University of Chicago. After spending the summer as an instructor at the

University of Chicago, I became an instructor in physics and electrical engineering at the Massachusetts Institute of Technology in Boston.

In the fall of 1904, I joined the Engineering Department of the American Telephone and Telegraph Company, which was then in Boston, and remained in that department, both in Boston and later in New York, until the spring of 1912. During the major part of that time, I was the Transmission and Protection Engineer of the American Company, in
2025 charge of its transmission and protection problems, particularly those of a research character. In the spring of 1912, I became Assistant Chief Engineer of the Western Electric Company, and I remained in that capacity until the fall of 1916, when I became its Chief Engineer. In 1922, I became Vice President of the Western Electric Company, in charge of its engineering, manufacturing, installation and general merchandise business, in so far as it related to the Bell System, and I remained in that capacity until I became Vice President of the American Telephone and Telegraph Company, and President of the Laboratories, on the first of January, 1925.

At all times during that period I had contact with research work. My position as Transmission and Protection Engineer of the American Telephone and Telegraph Company was essentially in control of that phase of the research and development work of the company at that time. I was instru-
2026 mental in inaugurating a research laboratory department of the Bell System during that period.

At the time I became Assistant Chief Engineer of the Western Electric, there were two assistant chief engineers of that company, who divided, somewhat generally, the supervision of the work of the Engineering Department between them. My part was primarily concerned with the research and development activities as distinguished from the more purely operational activities. Of course, as Chief Engineer of the Western Electric Company I had general supervision over all of the research and development activities of the Laboratories. When I became Vice President of

the Western Electric Company, although my supervision of the research and development in the Western Electric Company was somewhat more remote, I nevertheless was responsibly in charge of it, with the Chief Engineer reporting to me. Since January 1, 1925, my duty has been primarily that of supervisor of research and development.

2027 I am a Fellow of the American Institute of Electrical Engineers, and a Past President of the American Institute of Electrical Engineers. I am a member of the National Academy of Sciences, of the National Research Council, and was for a number of years Chairman of its engineering and industrial research division. I am a member of a number of foreign societies, including the Institution of Electrical Engineers of Great Britain. As to degrees and honors, in addition to my Doctor of Philosophy degree, to which I have just referred, I have received the degree of Honorary Doctor of Engineering, or Doctor of Science, from Columbia University, New York University, Rutgers University, Dartmouth College, the University of Wisconsin, the University of Chicago, and the Case School of Applied Science in Cleveland. I have received the Distinguished Service Medal from the
2028 United States Government, and the Order of the Rising Sun and the Order of the Sacred Treasure from the Emperor of Japan.

At the present time, the Department of Development and Research of the American Company comprises a force of about 550 or 560 people, devoting all of their time to its activities. The Bell Telephone Laboratories at the present time has a force of something more than 5,000. These forces are somewhat smaller than they were a year or so ago. The total annual expenditures in the two departments have been, for all purposes, as high as $22,000,000 or $23,000,000 per year. They are running at a slightly lower rate at the present time.

A very considerable part of that $23,000,000 is paid for what we designate as fundamental research and development. Another considerable part is paid for more specific development, which might be termed the engineering application of

fundamental knowledge to the production of specific
2029 things. In addition to that, there is a certain amount
which is accounted for by so-called engineering services, particularly in the Laboratories, and also a certain amount which is accounted for by limited manufacturing services which the Laboratories perform. That latter principally has to do with the manufacture of vacuum tubes, and other thermionic devices which are used in the Bell System and by the Western Electric Company, and which, while they are of a character that would normally be manufactured, would not be a function of the Bell Laboratories; they are manufactured in an organization under our control simply because they are such new things that it is impossible to set the requirements up so that they can be handled in an ordinary manufacturing establishment.

Of all this money that is spent, that part of it charged to my department for development and research of the American Telephone and Telegraph Company varied considerably over the last ten years. It has ranged, as I remember, from about $2,500,000, or thereabouts, in 1923, to as high as $9,000,000.

At the present time it is running at possibly a little less
2030 rate than that. About half of the laboratory expenses
which are charged to development and research are billed to the American Company. The other expenses are billed principally to the Western Electric Company. A smaller portion is billed to the Electrical Research Products Company for work done on its order. So that of the total expenses of the Laboratories, the Western Electric bears two-thirds or three-fourths of the total development and research amount. Of course, the manufacturing services, and the manufacture, are all billed to the Western Electric, because that is really not a development function, but is a service function which is performed for the Western Electric and not for the American Company. It would be performed by the Western itself, had they the facilities for doing that sort of thing.

These sheets are the analysis of expense by classes of work,
the annual sheets of the Department of Development
2031 and Research for the years 1923 to 1931 inclusive. They

show the expenses of my department so far as the salaries, wages and other expenses of the 550 or more men are concerned. They also show the expenses which are incurred in connection with work in the Laboratories charged to the Development and Research Department, or, in earlier years (the first three years I think it was), expenses of a similar kind incurred by the Western Electric Company and billed to the American Telephone and Telegraph Company. Those were the years preceding the formation of the Bell Laboratories.

There was no difference in the source of the research information and work in the Bell System for a number of years prior to the organization of the Laboratories, in 1925, so far as the Department of Development and Research was con-

cerned. That department has been organized as a
2032 department longer than the Bell Laboratories. The department as a department (separate from the Engineering Department of the American Company) was organized in 1919, but I was not a member of the American Telephone and Telegraph Company at that time, so I may be in error; but it is about that time. Prior even to 1919 that class of work was done. It was done in a part of the Engineering Department of the American Company, and was later split off, because of its growing size, to be a separate department of the American Company. The American Company has had no laboratories, except very insignificant ones, for experimentation in connection with new things it has sought to develop

since 1907. Prior to 1907, the American Company did
2033 have a laboratory for the conduct of the physical part of the research and development department. From 1907 to 1925, when the American Company wished laboratory work done in connection with its research and development studies, it had that work done in laboratories which were maintained as a part of the Engineering Department of the Western Electric Company. All of the laboratorial functions of the Bell System were consolidated in a single laboratory in 1907, and that consolidation was in the Engineering Department of the Western Electric Company. The laboratory was

located in New York. That laboratory work in connection with the American Telephone and Telegraph Company development was paid for by billing to the American Company, that is, the Western Electric billed the American Company for work that it did for the account of the American Company. There were separate requests made on the Western Company to do this work.

When the Laboratories were formed, there was no
2034 real difference whatever in the way in which the work was conducted. The Laboratories were organized as a corporate entity, part of the Bell System, on January 1, 1925, and at the time of their organization were the entire Engineering Department of the Western Electric Company. The Western Electric Company at that time ceased to have an Engineering Department by name, and ceased to have an Engineering Department as a functional part of its organization in so far as the development of products was concerned. The physical apparatus and forces that constituted that department in the Western Electric Company were transferred in their entirety to this new company.

2035 The sheets to which I have referred are in slightly different form for the first three years than for the last period. The content is the same, but the arrangement and classification is slightly different; the sheets from 1926 onward are in the present standard form, which was introduced following the organization of the laboratory. Those sheets show payments to the Laboratories in various years.

All of the work which the Laboratories do for the account of the Department of Development and Research is done on the authorization of that department. At the time the authorization is given, the estimated cost of the work is a part of the papers in the case, so that in authorizing the Laboratories to undertake a piece of work for the account of the American
2036 Company, we authorize a rate of expenditure or a total amount of expenditure and that is the authorization for the Laboratories as they incur the expense under that authorization to render bills to the American Company for payment. Those bills are the cost incurred under the authorization with

whatever the normal loadings are; they include all of the costs but no element of profit. The work is done without any profit, and so is of the general amount that would have been incurred had the American Telephone and Telegraph Company itself conducted the work in its own laboratory.

When these bills come back from the Laboratories for the work done in any case they are referred to the man or men who authorized that work. The amount billed is checked with the estimate originally given. The bills as they are rendered to the American Company by the Laboratories are referred to the department and sub-department heads, and, in the case of any considerable items, to the men who are in responsible charge of the work, to check as to accuracy with regard to the work rendered, the charge for the same, and as to whether it comes within the authorization.

2037 There is a wide variety of cases which are referred to the Laboratories and which they are asked to prosecute and make experiment upon. They cover a wide variety of things, but, in general, they all have the same basic element, that is, the element of acquiring physical information, scientific information which can only be acquired in a laboratory, or of creating something which involves that kind of information.

In many cases in connection with our theoretical studies in the Department of Development and Research, we are in need of scientific information which does not exist, and which can only be obtained by the conduct of experimental work, and, as we have no facilities for carrying on that experimental work, and the Laboratories have, that sort of work is submitted to them to be done. When it is completed, it may have no immediate application in physical things, but it becomes a part of our increased store of knowledge. Or we may be in need of some information of a physical character to enable us to advise the operating companies with regard to the installation or operation or maintenance of plant. That kind of work is submitted to the Laboratories to get the information.

2038 Or it may be that we have carried work far enough along so that the time has come to carry out those physical experiments which underlie the design of apparatus and those are submitted to the Laboratories. In general, as I have said, the kinds of work submitted to the Laboratories have to do with physical things, or the acquisition of knowledge which can only be acquired by experimental rather than by purely intellectual processes.

These cases for which we have been billed are confined to that general class of work except that sometimes in the conduct of our work we ask from the force of the Laboratories assistance of a kind where experimental work is not required, and that is billed to us.

Also, patent expense, incurred by the Laboraties organization in connection with patent matters of the American Company, is billed to the Department of Development and Research, and appears on these sheets, but is there only in transit to the Legal Department. It appears there simply because the Laboratories render all their bills to the American Telephone and Telegraph Company through the Depart-
2039 ment of Development and Research. Bills for that patent work are passed on to the Legal Department of the Company. The broad classification is that the work which is done by the Laboratories and billed to the Department of Development and Research is either work of a broad, fundamental character, which is required in the general studies for the advancement of the telephone art, or is work of a laboratory character, which relates to the problems of transmitting telephonic or telegraphic currents, but is not primarily related to the construction of apparatus. On the other hand, the work which is billed to the Western Company is that work which, in general, has to do with the development of
2040 specific pieces of apparatus or equipment, or the design of circuits which are to be manufactured, sold, installed, utilized, and maintained.

As these sheets show, the expenses of my department are classified under a number of general classes and sub-classes.

In the last five or six years, there have been, I think, nineteen general classes and over a hundred sub-classes. There are eighteen or nineteen general classes, and under most of them there are a considerable number of sub-classes. In some cases, the classifications, while appearing on the sheets, carry no charge. That is largely because this same general classification obtains in the Laboratories as well, and some classifications have charges there which do not appear on the D. and R. classification. In general, when work is authorized, the number or class assignment is given with the authorization, and all expenses, either direct or billed from the Laboratories, which pertain to that particular work, are
2041 charged to that classification. That is, in the case of direct expenses in the Department of Development and Research, the time of men on that classification is charged to that classification, and all expenses incurred, and billings from the Laboratories are charged to the classification.

Up to three or four years ago, we had an even finer division of the authorizations, in that every case in the Department of Development and Research bore a number or designation, and work was charged finally to those cases. But because these cases very frequently involved different general classifications, some years ago we came to the more general allocation of expense by these classes and sub-classes, and do not have the specific case number scheme in the Department of Development and Research. As the work is done, both the time and all the expenses which are incurred, such as material, or, if they involved traveling or outside expenses, are all charged to these classifications. These sheets are then made up by the Office Manager of my department from those time sheets.

2042 These sheets are the general current information which I and my subordinates have for the maintenance of control of the operations of the Department of Development and Research. They are relied upon by us and they are accurate. They contain information which is necessary for us in the proper conduct of the business. Well, including the two forms which are shown in this exhibit, these

sheets have been maintained for considerably more than ten years. I don't know just how long, because they were inaugurated while I was an officer of the Western Electric Company, but in the form in which the first three years' sheets here appear, they were in existence for a considerable period prior to 1923, which is the first sheet shown here.

(Plaintiff offered Exhibit A-114 in evidence; admitted.)

2043 The expense figure of $23,000,000 a year, which I gave, was for development and research in both the Laboratories and Department of Development and Research, although that figure is not far wrong for the total laboratory expenditures. The expenses that are shown on these sheets are substantially less. The highest is for the year 1930, which is a total of about $10,000,000 in D. and R., including the charges of the Laboratories. In 1923, it was about $2,800,000.

2044 I have made no computation relating those expenditures annually to the amount of plant of the Bell System for each of the years in this period by years, but I have made a computation taking the average of research and development expense for that period related to the average plant investment of the Bell System in the same period. That relation is that on the average we have expended about $1.89 a year for each $1,000 of plant in service. Of course, that same average would be arrived at if you took the figure for each year and then averaged the result of that. As I remember the figures, it would be less in the years 1923 to 1925, and then more in the years 1925 to 1930.

I am generally familiar with all of the work which is covered by Exhibit A-114, but, obviously, I am not intimately familiar with the smaller details of so vast a thing. But, in general, both as to the main classifications and as to the subclassifications, I am cognizant of the kind and character
2045 of work, and the purpose for which it is done. Viewing the work from the standpoint of the purpose for which it is done, I think I can break it down into a few general classifications.

There are a number of divisions, four or five. First, put into one class that work which the Department of Development and Research does to get together, put in form and present the information which is required by the operating companies properly to install, maintain and operate the plant which they use in the giving of telephone service. Particularly it is concerned with that kind of information as it relates to the newer things, the things which have been the result of research and development work and are about to go into general use in the telephone plants.

It has to do, second, with the studies concerned with the protection of telephone and telegraph plant, for example, protection against inductive interferences from neighboring trolley wires or high-tension circuits, lightning, electrolysis, and various things which may destroy either the plant or the use of the plant if not properly handled. That kind of work is undertaken by the Department of Development and Research for the benefit of the operating companies, in order that they may have the best knowledge and the best standardized methods for coping with that sort of thing.

2046

Then it has to do, as I mentioned, with the acquisition of fundamental knowledge applicable to the development of the electrical communication art. In connection with that we endeavor to keep thoroughly informed of the progress of scientific work and the progress of the communication art in other parts of the world, to the end that we may at all times have the best information on which to do our research and development work.

It has to do with the fundamental studies which are required to set the requirements for the development of new circuits or new arrangements of existing apparatus, in new combinations, for new purposes as they may arise in the associate companies, and of formulating the rules for their use.

Then it has to do with the work underlying the setting of requirements for entirely new things, where the general information which has been acquired is sufficient to make possible the creation of new things.

2047 It relates to circuit and system designs and arrangements and combinations of things that exist, in new ways. It relates in part to work which is done and directed to a specific result, which, if successful, will result in the manufacture of telephone apparatus or material.

The figures that are shown on the sheets which have been received in evidence are confined to work of the character which I have just described there, which is ultimately charged to my department on the books of the company. There are a few exceptions to that in some of the years. I have already mentioned the patents and I think in some of the years there are some minor things. Scattered through these years, there are a few minor deductions, particularly as they relate
2048 (as I remember it) to services which were rendered by us for someone else, and were transferred on the books. In one case, I think it is for the year 1930, there was a considerable item which does not show in detail on this particular sheet; it amounted, as I remember it, to something like $260,000 or $261,000, which was charged to the Department of Development and Research for work done in the Laboratories for which the American Telephone and Telegraph Company had agreed to assume the cost, but which was not a proper charge against the Department of Development and Research. It was in the nature of this patent expense to which I have referred; it appeared on our books as in transit, because the Department of Development and Research is the one to whom the Laboratories renders its bills. I think that item is included in Exhibit A-114. I have had a careful examination of our records made for the purpose of eliminating that and all other charges that passed through our books, but which were not properly charged to my department. I have gone further and I satisfied myself that the charges which were reported to me as being charges which should be eliminated
2049 should have, in fact, been eliminated. I did this by checking the original records. The sheet marked for identification as Exhibit A-115 is the tabulation of these deductions.

(Which said exhibit, A-115, is offered in evidence. Ruling reserved.)

This $260,000 item, to which I referred a moment ago, appears on this sheet.

After the deductions shown on Exhibit A-115 are made, the figure in the last column to the right of that sheet correctly shows the expenses of my department for the classes of work that I have stated in connection with the development of the telephone art. It is the net amount obtained by deducting from the gross amounts charges which were transferred to other departments, because of specific things, and after deducting certain items which were not done for the benefit of the associate companies and Long Lines, the principal item among which is this item I have referred to of two hundred and sixty odd thousand dollars. The principal reason for the research that we carry on, of course, is to advance, improve and cheapen the cost of giving telephone service through the application of scientific knowledge to the betterment of the equipment and methods which we have available for giving that kind of service. It was and is our belief that out of the new fundamental knowledge which has been made available through research work in physics, chemistry and the other sciences, there is much that, when properly studied, examined and amplified, and applied by competent men, is susceptible of many very material improvements in the giving of telephone and telegraph service in the items I have mentioned. The telephone art is most certainly not a static art. Up to the present, it has been one of the most rapidly moving arts that there is today.

In my opinion, there are reasons peculiar to the telephone industry, which do not obtain generally in other industries, why research such as we have done should be carried on. Because of the nature of the giving of telephone service, it does not have those elements of decreasing unit costs with increasing numbers of the units involved in growth, or has them to a lesser extent than is common in many industries.

So, since the giving of telephone service in large metropolitan areas, or where there are large numbers of subscribers, is involved with more expensive costs than in a

scattered or smaller community, it is only through the reduction in the unit costs themselves that we can hope to prevent an increase in the inherent cost of service as that service increases as regards the number of subscribers to be connected.

For an example of this, take the general situation which obtains when there is compared, we will say, the cost of giving service in a large area like the City of Chicago, and in a smaller area, say a city of ten thousand people. It might seem that the elements which in mass production make these unit costs go down should apply there, and that a city like Chicago should be a mass production affair. Actually, of course, there is substantially none of the elements of mass production as they appear in ordinary industry prevailing in the giving of local exchange service. The fact that the switching plant is very much larger means little, because every call which the telephone company is called upon to make is a custom-made job. Every day in this city, or in any city in the country,
2053 there are hundreds of thousands of connections being put up which have never been put up before and which in all probability never will be put up again.

All that the telephone company knows is that in a given exchange area they will get about so many calls a day and that they generally will be distributed in about thus and such fashion, but as to where they will originate or where they will terminate, it has very little advance knowledge; there are wide fluctuations in the number of calls from individual stations, and wider fluctuations in the destinations of those calls. So the telephone company has practically none of the possibilities which most mass production presents of making preliminary provision for the handling of those things. If the telephone company knew more definitely as to where these calls were going, they might make provision in advance and obtain some of the benefits of mass production.

Then there is another factor which is inherent in the giving of switching service, and is one which obtains whenever growth takes place and which works exactly in the reverse direction to the reduction of the cost. That is, when the

number of subscribers increases beyond a certain point,
2054 and plant facilities have to be provided for giving ser-
vice to additional subscribers, the unit costs in the case of some of the factors go up rather than down; they actually reverse in direction, and, so far as I know, they always tend in the same direction, upward rather than downward, although the size of their effect may vary under different conditions. I know of no case where these particular factors appear in the reverse direction.

An example which I have in mind of what happens when new subscribers are added and new facilities have to be made to take care of them has to do with the element of the switching plant, say in a local exchange area. The easiest illustration to understand would be one involving a simple manually operated switchboard (that is just by way of illustration, because the factors obtain by whatever means you do the switching). When you have a small area, all of the local connections are made by a single operator. In a small city you have one
exchange and every local connection is completed by
2055 the operator who receives the order from the original
subscriber. She has access to all the lines terminating in the exchange and one operator only is required as regards every connection, and no trunking plant. Now, because human beings have certain physical limitations and telephone operators are human beings, and their arms are only so long, there is a limit to the number of terminals that a single operator can reach. The standard in this country, using the type of plugs and jacks which we have in relays, is about ten thousand. Now, if you used smaller plugs and jacks, you could get more, but those bring in factors of increased maintenance and increased errors, so that for many years the standard in this country has been ten thousand.

Now, when the number of subscribers increases
2056 beyond ten thousand, with those limitations, it becomes
necessary to connect a considerable number of the subscribers to an additional central office. That is, if we had a small city that had less than ten thousand subscribers, we would need only one central office and one operator to handle

each call. Now, if the city grows so that there are fifteen or twenty thousand subscribers, we have to have more than one office. The first step, of course, would be to have two offices, and then for all of the calls which originated by subscribers in one office and were destined for subscribers in another office, you would have to involve two operators instead of one in the completion of the connection, and, in addition to that, you would have to have a type of plant which you do not have in the earlier case, namely, the interconnecting plant between the two offices. Each office would, in itself, be more
2057 complicated than the original office was, because it would have to have the equipment needed for handling this interoffice business.

The same factor obtains as the number of new offices are added. If the city grows to need three offices, you still have to have two operators involved in completing every trunk connection and then you have to have three groups of interconnecting trunks instead of one. Those interconnecting trunks may become a very important part of plant as the telephone plant grows.

I don't know how many offices there are in the City of Chicago, but taking a city with fifty central offices, if you had your service given as I have described it, with direct trunking between every central office and every other central office, so that only two operators were required, the number of trunk groups that would be required in that case would be found by multiplying the number of central offices by that
2058 number, less one, and deducting a half of it. That would be 1,225 separate trunk groups.

These trunk groups consist of pairs of insulated copper wires, in a city of the kind described; if a sufficient number of them are put inside of a lead sheath, they become telephone cables, and they are installed in underground conduit, or, in the outlying regions, in overhead cable. One of the problems of my department has been to find means to try and cut down the number of those interconnecting trunks. In many cases, that is accomplished for the more distant and particularly the

smaller central offices, which are likely to occur on the outlying fringes, by providing a third operator of some kind intermediate between the originating and the terminating operator, and handling the connection, not over a direct group of trunks from this office here to the office at the distant point over a separate group, but through this switching point.

That decreases the amount of plant required, at the
2059 expense of increasing the handling of each individual call. It tends to decrease the amount of trunk plant, but increases the central office and operating cost. It enables the trunk group from one of these offices to be used for connection to many offices.

Where we have found means to diminish the effect of this increase in the trunk groups, we have not found any means to overcome it. I stated that, so far as I know, as regards this factor, it is always present and I don't know of a case where it has ever been reversed. The quantitative effect of these kinds of factors, where we have this peculiarity of the telephone business, of course varies with different-sized cities and different locations and different conditions, but the effect is always apparently present.

"Q. Might it be said, then, Doctor, that the telephone business is, in a sense, a self-limiting business, and would be confined to smaller proportions if it had not been for the work of development and research which has continually substituted cheaper and more efficient means of doing the same thing?

2060 "A. I think that is correct."

It is largely through the results of research and development on a large scale, which have produced cheaper unit plant, that we have been able to keep the inherent costs from rising tremendously with the increasing numbers of subscribers connected.

Some of the work which has been done by the Department of Development and Research, shown on Exhibit A-114, resulted in the manufacture of apparatus by the Western Electric. All the work which we have done, shown on these sheets, has not so resulted.

The first classification of the work of my department to which I referred, that is, the contact with the associate
2061 companies and instructing them in the operation of new and standardized apparatus, did not have anything to do with the manufacture of apparatus by the Western. Expense incurred under that general heading has to do with the use of apparatus which they have, not with the manufacture of the apparatus. The expense incurred in connection with manufacture is precedent to that expense to which I have referred.

A very large part of that class of work which I referred to as the protection of our system from interference by electrical current of trolley lines and high-powered electric transmission lines has no connection whatever with the manufacture of apparatus. Some of it has some connection, particularly where it relates to protection from things like lightning; but where it relates (and this is a very large part of it) to the work which we do in connection with inductive interference or electrolysis, it has practically no connection at all with the manufacture of apparatus. I can say 95 per cent of our expense under that classification is directed to that kind of work. The work which has to do with circuits and
2062 system design has connection with the Western Electric Company to a considerable extent.

The class of work of a general nature which we have done in connection with fundamental research, may or may not have a connection with the Western Electric Company. A large part of it does not have any relationship to the manufacture of apparatus, but a considerable portion of it does, or is likely to. The other class of work which I have referred to, that is, work directed towards a specific result, has a direct relation to apparatus, either of Western Electric or somebody else's manufacture.

I think I could make an apportionment of the total expense of my department for each year shown on Exhibit A-114 among the beneficiaries of that work, which, in my judgment, would be a fair apportionment. Since practically all of

2063 our development and research department work is concerned with physical things and with the physical part of the associated companies and Long Lines plant, either directly or indirectly, rather than with operation costs or current costs of construction, the way I would make such an apportionment would be to take the total cost, as shown on these sheets, eliminate the items to which I have previously referred as being transferable or not properly chargeable to research and development (that is, the items shown on Exhibit A-115), and apportion the resulting amount (that is, the figure shown in A-115) to the beneficiaries in relation to the plant values of the telephone plants of the several beneficiaries. Before making that apportionment among the operating companies, I think I would make an adjustment or deduction in recognition of the connection between the Western Electric Company and our work. This statement is based on the assumption that the Western Electric Company has customers other than the associated

2064 companies and the Long Lines for the work to which this expense pertains; that is, cable and telephone apparatus. If it had no other customers, I would not make any such allocation, because the plant to which I would allocate this thing is not concerned with the way in which the expense gets to the allocation point. If the Western Electric sold only to the associated companies and the Long Lines, they would be the ultimate beneficiaries of our work and I would take no account of the Western in such an allocation. Since, however, they do sell some of this equipment on the outside, it would seem to me, since I cannot, from the very nature of the items of this work, apportion it very accurately, item by item, I would assume that all of it was related to the Western Electric Company's business, and find out what proportion of the Western Electric business is in this non-Bell field, and get a factor of value which resides outside of the Bell System.

2065 I have attempted to do that. The sheet marked for identification as Exhibit A-116 is the one on which I have attempted to do as I described. I succeeded as well as

I could; I think I have made an exceedingly liberal allowance for the Western Electric Company, because I have assumed that all of our work has relation to the Western Electric Company, but, as I just testified, a good part of it does not have a relation to the Western. In using these figures, however, I have used the total expenditures of my department, because, as I just stated, it is rather difficult to say which amount, in money, did not in any way contribute to Western Electric manufacture.

This exhibit (A-116) shows for each year of the period 1923 to 1931, inclusive, the Western Electric's sales divided
2066 between telephone apparatus and lead covered cable and between Bell customers and non-Bell customers. Column 1 shows the division for the Bell customers, and column 2 for the non-Bell customers. Those two columns are merely the volume of sales measured in dollars, that is, lead covered cable and telephone apparatus. Column 3 is the percentage which column 2 is of the total. Column 4 is the expenses of the Department of Development and Research, as obtained from the two exhibits which I have just put in evidence; specifically they are the figures shown on the right hand column of Exhibit A-115, which is the net result after deducting from the cost of the preceding exhibit (A-114) the transfer
2067 charges and certain special charges which are not shown. The fifth column is the amount obtained from the fourth column by applying the percentage figures of column 3.

(Which said document, marked for identification as Plaintiff's Exhibit A-116, was offered in evidence. Right to object and ruling thereon reserved.)

2068 I obtained the figures in columns 1 and 2 from the Western Electric Company.

For determining the maximum reduction from the sales of the Western Electric Company which I referred to, I would prorate the net, after this deduction, on the basis of the plant investments of the recipients. That would be an allocation to the Illinois Bell Company on the basis of its plant investment, and if you were desirous of determining the proper allocation to the Chicago area of the Illinois Bell, I

would carry it a step further and take the plant investment of the Illinois Bell in the Chicago area. I have done that; my calculations to that end are shown on the sheet marked for identification as Plaintiff's Exhibit A-117. The D. and R. expenses under the column headed 1 on this exhibit come
2069 from the preceding exhibits; specifically from the last column of A-115.

The figures in column 2 (of Exhibit A-117) came from column 5 of A-116. Column 3 is merely the difference between column 1 and column 2. Column 4 is the percentages which were given to me by Mr. Crumden and appeared upon the sheets which were offered by him in evidence this morning; they are the same figures as appear in the last column of Exhibit A-113. The last column on Exhibit A-117 is merely the multiplication of column 3 by the percentage figures appearing in column 4.

In my opinion, that method gives a fair share and no
2070 more than a fair share of the expenses of my department which are allocable to the Chicago area of the Illinois Bell Telephone Company in each of the years 1923 to 1931, inclusive.

(Exhibit A-117 offered in evidence by plaintiff. Ruling reserved.)

2071 I could take each classification of expense as shown on my sheets heretofore introduced in evidence and make a pro rate of the expense separately for each classification, but I do not think that it would be as accurate or as fair a pro rate as the one I have just testified to. I believe that the general method which I have followed, as shown on Exhibit A-117, is better than an individual pro rate of the separate items and expenses, for a number of reasons. It deals with total expense of the Department of Development and Research, which, as I have already stated, in the last analysis relates to plant, and since, from its very nature, it deals with the future and it cannot be accurately determined as to the places in which it will appear in the plant of the Company, any attempt to prorate that future work against existing factors must of necessity deal with rather general

yardsticks. When you attempt to apply a pro rate by these divisions shown in the expense analysis by classes of work,

large parts of the benefits derived from the expenses in
2072 many of the classifications appear under items which you would normally associate with other classes of work; that is particularly true with regard to the items having to do with more fundamental things, and, consequently, the things which are still remote from direct application, so while such a pro rate by classification of work can be made and while I have done it, I consider that if an allocation is to be made the way in which it has been done in Exhibit A-117 is the best that I know of to do it.

2073 For an example of what I have just said about work on certain classifications affecting portions of the plant that would be found in many other classifications, I will take an item upon which we have spent a very considerable amount of money over a period of years: the sub-classification vacuum tubes. The development of vacuum tubes appears under general classification 7 of these later years. Well, vacuum tubes, in their direct or indirect values, appear in practically every classification throughout the entire list. They appear either as parts of apparatus or as the necessary tools by which these pieces of apparatus were constructed.

After the deduction of the items shown on Exhibit A-115, the expenditures shown on Exhibit A-114 have to no extent whatever been incurred in connection with work of no value to the associated companies, considered separately and apart

from the Long Lines Department of the American Tele-
2074 phone and Telegraph Company. To a very considerable extent, the expenditures shown on Exhibit A-114 have been incurred in connection with work which has been and will be of little or no value to the Long Lines Department of the American Telephone and Telegraph Company. This is because some of the classifications under which the expense is charged refer to classes of plant which the Long Lines does not have at all, or, in other cases, has in very insignificant amount. In other classifications, while the Long Lines does

have some of the general type of plant covered by the classification, its amount is small in comparison with the amount in the plants of the associated companies.

The plant of the Long Lines Department, in the main, consists of long distance toll lines, which connect the territories of the various associated companies and over which is handled the business originating in the area of one associated company and destined for subscribers in another. In general, the circuits used are long. The associated companies have
similar plant, in all respects, except as to length; in gen-
2075 eral, the Long Lines circuits are longer than the circuits
of the associated companies. That is, our lines from New York to San Francisco are longer than any of the lines of the associated companies.

Many of the associated companies have lines as long as 50 or 100 miles. These lines are, in all respects, similar to the comparable lines of the Long Lines Department. They involve the same general problems and, in general, are constructed in the same general manner. The Long Lines also has a certain amount of switching machinery, which is similar in character to the corresponding machinery employed by the associate companies wherever that same kind of telephone service is given by the associate companies.

In addition to the character of plant that the Long Lines
has, the local companies have other kinds of plant.
2076 For example, the associate companies have a large
amount of local exchange switching plant and the Long Lines plant has no local exchange switching. The associated companies have a large amount of subscriber's loop and station plant, but the Long Lines has none of that kind of plant, because it has no subscribers. Considered from the basis of use, the associated companies have a large volume of short toll business similar, say, to that between Chicago and its outlying suburbs. Specifically, that type of suburban traffic involves, or may involve, a different application of the same general methods employed in the longer business. The asso-
ciated companies have their local tolls, and, in addition,
2077 of course, have the more distant toll service within their

areas, which is, in all respects, similar to much of the stuff which the Long Lines does, and then they have this local exchange service, which the Long Lines does not have at all.

The volume of the local exchange business is many hundred times greater than the total business of the Long Lines. The Long Lines handles no business under forty miles; it has no subscribers, and only carries messages for the subscribers of the local companies.

I have made an allocation on the basis of the separate items of expense shown on my sheets. The sheet marked for identification as Plaintiff's Exhibit A-118 develops such allocation.

The figures shown in the first column to the left on these 2078 sheets were obtained from Exhibit A-114. Those figures are identical, in all respects, with the figures shown on the sheet marked Exhibit A-114, except that the totals shown have taken account of certain deductions and transfers of the kind previously referred to and shown on Exhibit A-115. For example, on the sheet for the year 1930 it will be noted that at the bottom of the second sheet of that exhibit there is an explanation of certain single-starred items; this happens to be the one with that $260,000 deduction. Then there are certain items appearing above double-starred notations, which are transfer charges to other departments and have been taken account of in the total at the bottom. The figures appearing in column 1 are identical with the figures in A-114 and I have taken account of these deductions which are shown on Exhibit A-115 individually on the separate pages by starred references at the bottom of the sheet. They are, I think, identical, except as to total, which takes account 2079 of those deductions and allocations. The starred items at the bottom show the reasons for the difference between this total and the total on 114.

There are on the next column to the right, headed "Per cent Long Lines is of total", a number of percentage figures followed by some legend in each case. For example, take the

first group, for the year 1930, central office systems and apparatus; there I have set down the words "Central office equipment." By that I mean that when I attempted to allocate the expense under this classification as between the Long Lines and the associated companies, it was my judgment that the best factor which could be taken for that allocation was the investment in central office equipment. Obviously, it had little or no connection with outside plant or with sub-station plant, and while there is a tremendous amount of inter-
2080 relationship between the sub-items of the general classification, the whole of that classification pertains essentially to central office equipment, so I determined as the basis for prorating that first division of our expense shown on the sheet for 1930, the relative amount of central office equipment in Long Lines as compared to that in all the associated companies, including the Long Lines. It would seem to me obvious that I could not apply the same factor of total plant investment used in the other attempt to allocate in a case where so much of the plant was not involved.

I will now take up in a little detail the work shown on this exhibit.

Sub-class 101 represents the expense incurred for the development work of the Department of Development and Research in connection with local manual equipment and circuits. That is, the fundamental work, or the work previously described as that which we do in connection with advice to the associate companies on new things or on the acquisition of new
2081 knowledge, where it relates to the local plant. The Long Lines Department of the American Telephone and Telegraph Company does not furnish any of that service which I have referred to, and does not own or operate any plant of that character.

The next item, manual apparatus, has to do with our expense in the Department of Development and Research of the same general character as relates to apparatus which is used in connection with manually operated switchboards. The Long Lines use, own or operate some of that class of apparatus, because that kind of apparatus is used in all kinds

of manually operated switchboards. It is to a very small extent as compared with the local companies, however, because switching, which is a major problem with the associate companies, is a relatively minor problem with the Long Lines; that is, switching is the work done in connection
2082 with the handling of calls, and, as I have already stated, the local companies in their local work alone handle several hundred times as many calls as the total calls of the Long Lines.

The next item, panel equipment and circuits, 103, relates to the same general character of work in the field of panel machine switching equipment and circuits. The Long Lines does not own, operate or use any panel equipment whatever. The next item, 104, is panel apparatus. It corresponds to 102, and relates to the apparatus side of panel machine switching. Of course, it correlates with the item 103. The Long Lines does not own, operate or use in any way any of that class of apparatus.

The next item, 105, is the corresponding expense for the same purposes in connection with step-by-step machine switching, which is used by the local companies, and
2083 none is used by the Long Lines, that I know of. The same is true of 106 and 107.

108, toll equipment and circuits, applies to the same general character of work previously described and covers all toll equipment and circuits for both Long Lines and the associate companies, and both long and short toll circuits. The amount of that equipment in the local companies is many times the amount in the Long Lines.

The next item is P. B. X. equipment and circuits, which occur solely in the plants of the associate companies.

The next item, power equipment, is of the same general character, and relates to the problems of power supply
2084 in exchanges and elsewhere in the telephone plant. That is used by both the Long Lines and the associate companies, but relatively, of course, a great deal more is used by the associate companies than by the Long Lines. The associate companies' power equipment problem, because of the

vaster size of their unit, is, on the whole, a more exacting and larger requirement.

The next item, testing and maintenance equipment and apparatus, applies everywhere where central office equipment is used.

The next item, engineering on equipment orders, is just an insignificant thing; I do not know just what that is. Fundamental studies (A. T. & T. Co. only) are just what the name implies; they are fundamental considerations concerned with any of the problems of switching.

The next item, miscellaneous, covers, as I remember it, the odds and ends of things which cannot be easily differentiated between, but which all come under the problem of the classification of central office systems and apparatus. I think under this fundamental studies item are such things as the
2085 mathematical studies which are involved in probability studies, which have to be made in order to determine how many pieces of equipment and how many trunks have to be put in in order that not more than a given number of lines will be found busy; and things of that kind.

After fundamental studies, there appears on this sheet, in brackets, "A. T. & T. Company only". That means that that was expense incurred only within the American Telephone and Telegraph Company, and while the classification might appear on the uniform classification in the Laboratories, there was no billing from the Laboratories. That designation has been there, I think, for a considerable time, and it is barely possible that some slight billings may be found in recent years from the Laboratories under that, but originally it was a classification appearing in which the expense was incurred only in the American Telephone and Telegraph Company Department of Development and Research. That is true with regard to all the items on these sheets where the same legend appears.

In view of all that I have said here, I lumped together all of the expenses of that class (central office systems and apparatus) and applied to it the percentage of central office
2086 equipment of the Long Lines as compared to the total

in the System. I think that procedure gives a fair and reasonable allocation of that work, although my feeling is that, if anything, it allocates somewhat too much of this cost against the Long Lines. I do not think that I have allocated any other items on these sheets on the same basis as central office equipment.

The next classification on the sheet is sub-station equipment. I have allocated that wholly to the account of the associate companies, because the Long Lines has no plant of that kind.

The next classification, No. 3, is outside plant. Since
2087 outside plant involves work connected with the line portion of the Telephone Company's plant, I have allocated it on the basis of the relative investments in exchange and toll line plant.

For the next item, transmitters, receivers and induction coils, I have allocated nothing to the benefit of the Long Lines, because they have no transmitters and receivers and only an insignificant investment in induction coils.

Skipping down to classification No. 8, other communication systems and apparatus; that relates to things which are not primarily telephony or telegraphy, as used by the units of the Bell System. It is indicated fairly there by the subclassifications. In an attempt to apportion that between the several units, since it is the type of thing which may appear anywhere, and since it has to do with the electrical
2088 transmission portion of the plant and does not apply to land or buildings, it seemed that the fairest thing to do was to take the ratio of plant investment less the investment in land and buildings, and that is what I have done. The last item on the first sheet of 1930 is lead covered cable. That follows the same rule as classification 3, outside plant, and for the same reason. That is, outside plant appears both in the plant of the Long Lines and of the associate companies, and I have apportioned it on the basis of the relative outside plants of those companies.

The next item, item 10, is submarine cable. That is a very general classification. Much of the expense incurred has not found any considerable application in plant anywhere. It is

difficult to know where it is going to occur, but it seems clear, as far as one can see ahead, that the benefits are generally applicable, so that the only way I know of dividing that is to take the ratio of plant in service.

2089 Classification 11, materials and processes, relates to all sorts of things which apply to the parts of the plant, less land and buildings, everywhere; studies having to do with the paint finishes and matters which are of general concern in the electrical portion of the Telephone Company's plant are involved, so I have allocated that on the ratio of plant in service, less land and buildings.

The same thing with regard to 12, fundamental studies applying to communication; they are of general application and affect, or may affect, all parts of the electrical portion of the plant. That is comparatively small for the year 1930 after the deduction of the items that I have referred to and that are starred at the bottom of the page. It is small in 1930, but it is large in the next year apparently. The

2090 titles of the sub-classifications give a fair picture of where a considerable amount of our expense has been incurred. The telephone quality studies are fundamental studies designed not only to find out why deficiencies in telephone quality now exist, but how to build plant in the future which will have better quality characteristics; to get the basic knowledge of speech and hearing and transmission which will give for higher quality. The transmission theory classification has to do largely with mathematical considerations of the transmission of high frequency current and complex high frequency current over all kinds of structures; it affects all parts of the plant. There are numerous relatively small fundamental studies which come under the classification general here, but are not classified by separate divisions.

I have not allocated the next item, patent, because, as I have testified, that is transferred and I have excluded it.

2091 The next item, No. 15, is rate case testimony. I have allocated that entirely to the associated companies; the Long Lines have had no rate cases, or at least none in which we have participated in any way. This study is merely for

the purpose of attempting to allocate the value of this expense of ours among the beneficiaries, and no billing of this kind has been made.

May 10, 1932.

2093 The next classification, No. 16, is interference prevention and protection. The work carried on under that classification is largely as indicated in the sub-classifications, and principally under sub-classifications .02, .03 and .05, which have to do with fundamental studies looking to the development of methods for protecting telephone plant against the deleterious effects of inductive interference disturbances from neighboring power or railway circuits, or protecting them against the deleterious effects of electrolytic damage in the case of underground cables, from stray currents which flow off from them. It involves, principally, studies in the field and studies in co-operation with the utilities which produce this interfering current, to the end that ways and means may be found for eliminating or reducing the deleterious effects. In addition to that, there is a considerable amount of work which

2094 is done and charged under sub-classification .01, which has to do with the negotiations side of this co-operative work, looking to the standardization of rules for joint use, and for the proper construction of plant, both in our telephone business and the plants of the interfering companies. For the apportionment of that work, I have selected the basis of exchange and toll line investment, because, in the main, that work is all applicable to that part of our telephone business. The next item, No. 17, is miscellaneous. That has to do with a large amount of miscellaneous fundamental work connected with all phases of the physical plant used in the giving of telephone and telegraph service but of such a character either that the individual items are relatively small in

2095 amount or of a character which involves work under a number of other classifications, and they are consequently lumped together under this miscellaneous item. I have dealt with that as allocable on the basis of relative investments of all plant in service, less land and buildings.

The next item, No. 19, is engineering services. I have not allocated those expenses, because they have been passed on to some other department.

The expenditures for all other years were treated by me in the same manner for all of those years as they were treated in 1930, about which I have been specifically testifying, and, in detail, were treated specifically the same for classifi-
2096 cation subsequent to 1926, when the expenses, of course, were kept in the form of the sheet at which we have just been looking. That includes the year 1926 and subsequent years. Throughout that period, I have applied the same basis of allocation to each of the divisions of work shown on the sheets of Exhibit A-114 as I have already testified.

As the charts show, the general classification and the sub-classifications for the years 1923 to 1925, both inclusive, are somewhat different in designation and somewhat different in arrangement, although the character of all of the work done is the same throughout. Specifically, take the thing
2097 which appears as classification 1 in the later years; in the first three years that appears as three main classifications: local central office equipment, toll central office equipment, and private branch exchanges. Those are the three classifications on the sheets for the years 1923 to 1925, inclusive, and all three of those classifications are lumped together and appear under classification 1 on the sheets for 1926 to 1931, inclusive. By taking those three classifications together, you get the same class of work that I have dealt with in describing my pro rate of the first subdivision in the year 1930, and I have applied the same basis of pro rate as was indicated to those three classifications.

The next classification of the first three years, sub-station equipment, is divided and appears in the later years as two classifications, 2 and 4, sub-station equipment, and transmitters, receivers and induction coils. I have applied the same basis of allocation for this consolidated classification of
2098 the earlier years. The classifications for the first three years are such that I have been able to proceed in the same manner and pro rate the same class of work on the same

basis which I used in subsequent years, and the figures that are set down in the columns on these sheets show the same pro rate in effect.

In those columns where there are set forth bases such as I have mentioned, like outside plant, toll and exchange lines, and things of that kind, there are percentage figures in connection with them. I did not develop those percentage figures. I got them from Mr. Crunden; from the exhibits that he put in yesterday. In classifications 5, 6 and 7, I applied one percentage to these three classes combined, and did not
2099 treat them separately. I proceeded this way because from the nature and character of the work under those classifications, I was not able to develop any individual classifications of allocation for them, or if I had segregated them, they would have all had the same classification as I have shown for the consolidated. The reason for that is that in these classifications (these three classifications, more than in most of the other classifications), the character of the work is peculiarly fundamental, and is farther in advance of current application than it is in most of the other classifications, and consequently, it is not only extremely difficult to find any current yardstick by which to measure a future use, but it is the fact that a large part of the work which is done under these classifications finds it application, or may find its application in practically all of the other classifications. So I have treated these three as a combined classification in this attempt to allocate, although the detailed story with regard to each of these classifications varies a little bit, but, in general, the net result is the same, namely, that they are all classes of general application of fundamental research and development work.

2100 "Q. Well now, with respect to all the classifications on the 1930 sheets, except 5, 6 and 7, have you made your allocations substantially on the basis of the use of the effects of your work in the year in question?

Mr. Haight: That is objected to, a general conclusion of that sort, and incidentally, it does not correspond at all with the general facts put forth as specific facts by the witness.

"Why a conclusion of that sort should go into the record, I do not know.

"There is no foundation at all, also, for putting the word 'use' in there, not the slightest.

"Judge Wilkerson: I suppose it calls for the conclusion of the witness, to tell how he—

"Mr. Blackman: He is an expert, sir. It is not a conclusion. I think perhaps the question may be somewhat
2101 objectionable on the ground that it is leading.

"Judge Wilkerson: Yes.

"Mr. Blackman: But that objection has not yet been made.

"Judge Wilkerson: Let the witness go ahead and tell how he made that up.

"Mr. Haight: The fact that it is leading—we do not object to it on that account, but incidentally, also, what is the meaning of the phrase 'use of the effects'?

"Judge Wilkerson: Well, explain that phrase, and then answer the question."

The basis of the allocation in all of these cases is as indicated on the sheets. It is plant in service less land and buildings, or plant, or what-not, which seemed to me the best basis, as regards these separate classifications, for an allocation. Much of the work in all of the classifications has, in its very nature, no present application, and consequently, since I am not clairvoyant as to the exact places in which this will appear in the future, I have been forced to take the best current application which is available to me under that general basis, which are the ratios as they exist in the plant of today.
2102 They are ratios of investment in these several plant items as between the Long Lines and the associate companies; it seems to me, on the assumption that in the years ahead, when much of this work will find its place in the plant of the Bell System, the general ratios will not change very much, that is a fair allocation. Certainly the fairest one that I can make, because I have no ratios of future conditions.

"Q. Well, taking the year 1923, say, in your opinion do the allocations there allocate your expense on the basis of the use

that was then being made in the various plants in the Bell System, of that work—

"Mr. Haight: I object to the question.

"Mr. Blackman (continuing):—or developments generally?

"Mr. Haight: The question obviously is right in the teeth of the last answer of the witness.

"Judge Wilkerson: Well, let him tell it.

"Mr. Blackman: That is not leading, sir.

"Judge Wilkerson: Let him state it in his own way.

2103 "Mr. Haight: I have no objection to that.

"Judge Wilkerson: State in your own way how you made it up, now.

"The Witness: Well—

"Judge Wilkerson: He has directed your attention to the subject. Now state it in your own way.

"Mr. Haight: The witness says, 'There is no use; consequently, I have to make a guess', and thereupon counsel says, 'Tell us the allocation made on the basis of use.'

"Mr. Blackman: That is about as—

"Mr. Haight: If that is logic, I do not understand it.

"Mr. Blackman: You do not understand it at all; that is the difficulty.

"Mr. Haight: Of course, I do not.

"Judge Wilkerson: He says he makes the allocation on the basis of the condition as he finds it now in the plant, does he not?

"Mr. Blackman: Yes, that is it.

"Judge Wilkerson: And in that sense you do not mean, on the basis of the use, present use of the things which you are allocating.

"Mr. Haight: That is it.

"Mr. Blackman: That is what I wanted the witness—

2104 "Mr. Haight (continuing): Of course, he cannot mean that.

"Mr. Blackman: Let me put it this way; I will put another question.

"Q. Doctor, when you say—

"Judge Wilkerson: You say, they are not in use now.

"Mr. Blackman: Your Honor, most of this stuff is used now, but he said he could not look into the future as to this, and determine the relative future use.

"Judge Wilkerson: Now is there a serious difference here?

"Mr. Goldstein: It makes a difference in the whole thing.

"Judge Wilkerson: Maybe you had better give them the difference, rather than spend the time on it. I do not know. I think I understand what you mean, and I understand the basis of Mr. Haight's objection. After all, it comes down to some disagreement as to the meaning of words.

"Mr. Blackman: Yes. Well, I would like to have that clear.

"Judge Wilkerson: Apparently Mr. Haight thinks you have used the word 'use' in a double sense; is that it?

"Mr. Haight: In part.

"Judge Wilkerson: That is, you have used it in one
2105 way in your question, and the witness has used it another way in his answer.

"Mr. Blackman: Well, sir—

"Judge Wilkerson: That seems to be the difficulty.

"Mr. Blackman: We can clear that up.

"Judge Wilkerson: Yes, clear that up.

"Mr. Blackman: Q. When you said, Doctor, that you have based your allocations for each year on the conditions as you found them in that year, what did you mean by that?"

I think just what I stated in the explanation just preceding. Now, it is probably true for the 10 years back that if one could make the very formidable analysis which would be required of the expenditures which were made in the year 1923, they might have developed a slightly different application from what we foresaw for them in 1923. But, in my judgment, in looking over these figures, the basis of allocation is substantially correct for all of the years, based on the conditions of relative plant investments in those years, that
2106 is, the plant investments of the Long Lines and the associate companies in telephone and telegraph plant of the various classes indicated in this allocation.

Taking this specific class, the central office equipment, I have allocated that in the year 1930 and in the year 1923 on basis of the relative plant investments of the Long Lines and associate companies in that class of plant. I have allocated the work shown in that period on the basis of the relative amount of plant of the kind stated opposite our expenditures as they existed in that year in the relative plant. I did this because it seemed to me that since this work in each of
2107 these years, and at all times, is work of very general application which finds its field of use, or may find its field of use almost anywhere in the plant, this method of allocation is the fairest if you attempt to try and divide our fundamental research and development work by these separate classifications. I have already indicated that I think the best method of allocation is the method which I originally used, of dividing the total net expense for each year against the total plant in service ratios.

Among the three classes that I have mentioned last, that is, 5, 6 and 7, radio appears. In the period 1910 to 1931, inclusive, that is 22 years, the total charge for work in this classification of the Department of Development and Research (that is, radio and related subjects) has been approximately $11,500,000; and for the period of these charts, 1923 to 1931, inclusive, it has been approximately $9,600,000. In other
2108 words, the larger proportion of our total expenditures over the past 22 years has been in the period 1923 to 1931, inclusive. During that period the expenditures represented by this classification were, to my recollection, less than one-fifth of our total development and research expenses. On the basis on which I arrived at the $1.89 figure yesterday of the average expenditure over the period as applied to the average investment in plant during that same period per thousand dollars of plant, this would amount to a little less than one-fifth of the $1.89, so that it would be about 36 cents. The average expenditure over that period would then be about 36 cents per thousand dollars of average total plant investment.

Radio is now used in the Bell System to a very limited

extent. Practically the entire use of radio in the Bell
2109 System is in the trans-oceanic and ship-to-shore services, which are furnished by the Long Lines Department. There is a small incidental use, possibly a growing use of it, in the plants of the associated companies, three or four of which have in recent years established radio ship-to-shore for harbor craft, installations to give telephone service to ships in the neighborhood of harbors.

The Long Lines division has never run its various radio services at other than a loss, and they are now being run at a loss; so far as I can see, all of these services are destined to be run at a substantial loss for a considerable period of time ahead. Each individual one of the services has been run at a loss continuously up to the present time.

2110 As of January 1, 1932, the Long Lines' investment in radio plant, not including its investment in any wire connecting lines, but purely its investment in the radio plants themselves, was approximately $5,000,000. At that time, January, 1932, the rate of loss which the Long Lines division was incurring in connection with those services was approximately $600,000 per year. At the present time, because of increased investment in the extension of these plants and decreased business over them, I assume that that figure would be found to be considerably higher. However, it is at least $600,000 per year. In figuring the loss which I have referred to, no return on investment was included.

These services were begun, continued and extended
2111 because it was felt that this type of service, which extended the facilities for telephonic communication to include connection to telephone systems in other continents or to telephone stations on ships, was of advantage to the associate companies and their subscribers.

The radio services that I have referred to do not, in my opinion, measure the advantages which have come from our expenditures in connection with research work in the field of radio.

Our first investigations in the field of radio commenced in a small way very shortly after the Marconi experiments of the

late '90s developed the fact that radio, that is space conduction of electrical energy, had the possibility of giving distance communication, telegraphic communication, without the use of inter-connecting wires. Those experiments opened up an entirely new field of possible development of electrical communication. However, our interest was not very large in those very early years, because the art was very new, and very crude, and seemed very distant from any of our
2112 immediate problems. As a matter of fact, we did not begin to do anything very substantial in the way of research and development for 10 or 12 years after the Marconi experiments, because of this condition to which I have just referred.

But when the radio art, itself, still wholly in the telegraphic field, had developed the instrumentalities, or the beginnings of instrumentalities, which indicated the possibility of telephony carried on by those means, it became a very important matter for us, because, it being an entirely new kind of transmission from any which had heretofore been used and being in a field in which very little was known and for which very much was claimed, it was of the utmost importance to know not only all that could be known about it and its possibilities, but for ourselves to be in a position to make use of that knowledge, if, as and when the art developed to a point where it was a practical thing. Very great claims were made at that time, and have been made since, and are still being made for the influence which this art is likely to have in connection with the whole field of telephone and telegraph com-
2113 munication. The nature of these claims, their widespread character, and the fact that the radio art had possibilities, and a very great uncertainty as to what its future might or might not be if the claims made for it were substantiated, as a result of further research and development work, it obviously would have a wide bearing on the business of any organizations in the field of telephony or telegraphy.

Further than that, it was perfectly clear that since it was a new art, involving the same general kinds of considerations

that underlie all electrical transmission for telephony or telegraphy, there was grave danger that research and
2114 development work would produce patentable inventions of such broad scope as to be controlling in all fields of electrical communication. There was, therefore, every reason for us to be at all times in the fore front of knowledge concerning the possibilities and limitations which inhered in this new field. And in connection with the matter of patents which might arise out of the radio work, but which would have a broad application in the field of all communication, it was equally clear that if such patents did develop in the hands of outside interests, they might very seriously jeopardize the business of all of the Bell System, including all of its associate companies, because from the very nature of the patent property, the rights under those patents or to use those patents might not be obtainable for any monetary payment.

In matters of this kind where rights under fundamental or controlling patents are desired, in most cases the best way in which to acquire those rights is for the party seeking to acquire them to be himself in a strong technical and patent position, because by that process he may be in a position to have a trading situation under patents which forces the availability of the rights he wants.

2115 In the very early years of the period which I have referred to, say from 1910 or along about 1910, we had no general information that any other large companies were actively engaged in prosecuting research work in the field of radio. But we did know that substantial companies and very able people all over the world were operating to develop this new art, and out of that work which was, of course, very early in the stage of the development of this art, very controlling patents might arise. A little bit later we had knowledge that some of the large electrical oganizations, not only in this country but abroad, and in this country particularly, were actually engaged in the development of that art, or portions of that art. And in pursuance of our desire to protect, and not only protect the existing property of the operating companies, but, likewise, to put them in a position to make use of

anything which grew out of this art, we embarked early on a large program of research and development, as early in the development of the radio art as it became clear that there was some possibility of its use in the field of telephony.

2116 The business of the associate companies is the business of giving telephone and telegraph communication service; it is not the business of dealing with a particular way of doing that sort of thing. What we had feared might happen did actually happen, and we found ourselves about 1919 or 1920 in the position where not only the growth of the telephone business of the associate companies, but possibly its very existence, was tied up in the patent property of outside interests.

As a matter of fact, when that situation developed (and it developed at a time when we ourselves had a very strong patent position), it was actually found to be impossible to secure these controlling rights for a sum of money which was far greater than all that we had ever spent on radio development; but because we had ourselves a strong patent and technical position which controlled some of the things which the owners of these outside patents needed in their business, we were able to obtain the rights which were required for the development of the telephone business of the associated companies and the Long Lines without the payment of money.

2117 My recollection is that these arrangements were effected by two cross license contracts, the first of which I think was about 1920, and the second about 1924. This cross licensing involved among others the General Electric, the Westinghouse Electric & Manufacturing Company, the Radio Corporation, and the United Fruit Company, which at that time had in connection with its shipping business developed a very substantial position in the radio field.

Broadly, what we got under that agreement were complete licenses in the field of the business of the associate companies and the Long Lines as the givers of telephone and telegraph service, to utilize all of the existing and prospective patents of this group. When I speak of prospective patents, I mean

any patents that they might thereafter develop, during the term of these cross license agreements.

2118 To get that we gave up rights under our existing and prospective patents in fields other than the telephone and telegraph communication business, and we gave up substantially all rights with regard to certain kinds of telephone transmission; notably, substantially all of the rights with regard to one way reception, such as is employed in news, music and entertainment broadcast distribution, and rights in the giving of two-way radio telegraph service for public use. Those rights which we gave up were of very great value.

Since we made those arrangements and obtained full opportunity for our Company to operate its telephone business under all these patents, we have continued to spend money on the investigation of the radio field. We have done this for identically the same reason, among other things, that had impelled us before that time, because while we had safeguarded the situation as regards this particular group, there was an increasing development going on, not only here, but abroad, in this field of radio, among groups and individ-

2119 uals who were not involved in these cross license agreements. While the radio art had developed very considerably since the Marconi days, it was still and is still a new art, and there are still possibilities of very substantial controlling inventions possible of being made, and we felt and feel that we must continue to do this kind of work in large measure as long as that condition exists, in order to insure the safety of the business of the associate companies and the Long Lines, to permit them to develop their business with the freedom to use whatever instrumentalities and whatever methods are most desirable at any given time.

There are other or additional reasons for the continuation of this work. Some of these are: among other things, our work in this field, in the field of this classification to which you are referring, and in the two adjoining classifications, 5 and 7, has indicated that many of the instrumentalities which first appeared and were worked on because they had a relation to radio, are things which have a broad application in all

communication development work, either directly or
2120 incidentally. Also many of the techniques which were developed in connection with radio development, and in the development of the arts of these other two classifications, have application entirely outside of the field of their original use.

The first important or fundamental objections that were considered as making radio not usable in the telephone field were:

Going back to the very early days, the years immediately following Marconi's work, when the whole radio telegraph art was essentially what is termed the spark transmission type, the very type of radio in those years was such as to preclude its use as a vehicle for telephone communication. At a somewhat later time, and particularly after the coming into the art of the vacuum tube, when it became possible to develop high frequency currents of uniform characteristics which could be modulated and amplified, and when radio telephony appeared, or the beginnings of radio telephony appeared as a possibility, there were still some very inherent obstacles to any considerable use of radio as a means of telephony.

Among those was the fact, first, that at that time practically
all of the energy which was radiated from the trans-
2121 mitting antennae spread out in all directions, with the result that only a very small fraction of the energy could be directed toward the point where you wanted to receive it. In other words, large powers for insignificant results were involved. That was particularly true because at that time the art was one involving relatively long wave lengths, and the only way that you could conceivably direct that energy was with enormous structures.

Likewise, at that time, because these wave lengths were long, the number of channels which might be available for this service were very limited in extent, and indicated that if the art never went any further than that, in the very nature of things, there could only be a very small usage.

Also the element of secrecy or privacy was absent. The

radio transmission was essentially non-secret. The very fact which makes radio broadcasting what it is was a deterrent to the use of radio in the field of ordinary telephone service. Likewise the radio transmission in this particular range of frequencies is very subject to interference from natural causes, static disturbances, which would tend to make a circuit, any telephone circuit, a very uncertain and very
2122 undesirable kind of circuit. That static interruption characteristic is still present in that range, but has been minimized in recent years somewhat by the increased knowledge which we have of the directional situation, of the possibility of building directional receiving antennae so that we have reduced the amount of static interference by eliminating substantially the interference which comes from all except one direction.

The inventions of De Forest removed some of the fundamental and seemingly insurmountable obstacles to the use of radio in the telephone art. Since De Forest's invention of the so-called vacuum tube, or audion, which completely revolutionized the whole art of radio, very substantial progress has been made, not only by us but by others, in overcoming the objections of lack of secrecy, lack of directional control, or lack of power to direct the waves and interference by static.

We have taken a very major part in that development,
2123 and that development, in general, has been in these directions: the spectrum, the frequency spectrum of the days preceding De Forest's work, the one to which I refer, which limited the number of possible channels to a few in the longer wave lengths, has been very much broadened in the direction of making very much shorter waves utilizable.

Those short waves are in actual commercial use at the present time by the Bell System in our services to Europe and elsewhere.

Now, there has also been, of course, an enormous development in the perfection and cheapening of the instrumentalities which are used in connection with radio, either for the production of the signals or their reception. And, in connection with those transmitting and receiving instrumentalities,

we have learned a great deal about how to direct the energy generally in the direction in which we want it to go, and to pick it up.

The effect of very materially shortening the wave length, or conversely, increasing the frequency, has been to make possible very much smaller transmitting and receiving
2124 station structures. In the art of the earlier period to which I have referred, the wave lengths which were used were thousands of meters or thousands of feet long. The wave lengths of the art to which I have just referred as being in use in the Bell plant largely are on the order of a few feet, and because they are very much shorter, the structures which you use in connection with your transmitting or receiving antennae are relatively small things, and are capable of radiating the energy substantially in the direction in which you want it to go rather than having it broadcast all over the 360 degrees.

Also the static effects which were so objectionable in the longer wave lengths area, and which are the things which we commonly witness in our radio receiving sets, are substantially absent in those things. Another kind of static trouble, or another kind of atmospheric trouble is there, but that kind of trouble does not exist elsewhere.

The thing that I have referred to here as the ability to more or less direct the energy in the direction in which you want it to go, with relatively small structures, is a commonly known problem of any wave transmission in geometrical optics;
2125 it is simply the statement that the shorter the wave length which you employ, the smaller the structure can be, to get a definite kind of result, to get a beamlike transmission. Every pushing down of the length of the waves which you can employ, or what is the same thing, the broadening of the spectrum at the shorter wave length end, tends to do two things. First, it tends to increase very materially the number of channels which are prospectively available; and second, it tends to cheapen the type and increase the efficiency of the transmitting and receiving apparatus. It affects the power

to direct the course of the waves of sound in the direction in which you wish them to go.

We have progressed in actual experimentation beyond the point of the short wave lengths as I have already described them. The wave lengths which are employed in the various so-called short wave channels, which are employed in
2126 the transatlantic, South American, Hawaiian and other transoceanic service furnished through the Long Lines, are approximately 15 meters, or 12 to 15 meters long; that is to say, three times that number of feet. Experimentally we have been able to carry the spectrum down so that the wave lengths are only a foot or two long, and to produce the necessary kind of apparatus for the generation and modulation of that kind of waves, and to detect and demodulate and make use of those waves as they are received. In other words, we have gone down to a fraction of even the short wave lengths which are now employed in the giving of long distance radio telephone service, and to a very small fraction of the wave lengths which were employed in the earlier art.

With respect to the short wave lengths which we use in our transoceanic service, we are able to so deal with them to a considerable extent so that the conversations will not be understood by persons who intercept. Radio in its very nature is not secret, because any element of secrecy or privacy which exists is inherent in the receiving equipment, and if the energy can get into one receiving equipment and be understood, it can equally be understood if it gets into
2127 another receiving equipment. The most you can hope for, therefore, in connection with radio is privacy against a casual observer. But it is possible to provide a high degree of privacy in such services as the transatlantic service by so altering the form of radio transmitted energy that it is in space no longer intelligible, but it is made intelligible by the proper equipment at the receiving end. That means that even if the message is picked up by a person with apparatus capable of picking up these short wave lengths, but not provided with this special decodifying equipment, it is not understandable. So, in general, what we have is a system which is

private to all intents and purposes, but is not secret against the malicious tapper of the service. The term which is commonly applied to this is that we "scramble" the speech at the transmitting end and "unscramble" it at the receiving end. With this ability to make speech private, and with these ultra short wave lengths which I have talked of, there is, in my opinion, a prospective use of radio, without the use of any
2128 wires, in the plants of the Bell System. We are not actually employing those ultra short wave lengths in wholly commercial communication at the present time, but we are in actual experimental communication. I do not know all of the points where the experimental work has been carried on, but there is an actual installation between New York and Newark, a distance of eight or ten miles. We carry on conversations without the use of wires over this apparatus and with the use of the short wave lengths.

Because these wave lengths are so short, on the order
2129 of a foot or two in length, with even very small structures, we are able to direct the energy within an angle which is only a fraction of the angle of directivity of the wave lengths, we will say, of 12 or 15 meters.

We have found means to deal with radio communication, or communication in the nature of radio, and further direct it and confine it so that it reaches only the source we
2130 wish it to reach. We have been able to develop a form of cable structure in which the effect is that of having segregated out a small portion of the ether and localized it for use between any two predetermined points, without risk of the signals employed on it being radiated into space, or without the converse danger of signals in other parts of the ether being radiated into it and interfering with the messages. In other words, it is a form of localized private ether, if you like. That structure consists essentially of a pipe with a minimum amount of material inside of it, and with a conductor centrally located in the center of the pipe. By "conductor", I mean a copper wire or a small copper tube. So that the part of the ether with which you are dealing is merely

that other which is enclosed in the pipe and between the inner surface of the pipe and the circumference of the central wire.

We have not that apparatus in actual use anywhere. We have made various experimental installations of that type of structure, and know how to employ it. There are no
2131 technical obstacles to its use at the present time. The obstacles are the normal, practical obstacles which inhere in any new development, of finding the ways and means of creating the structure that you want in the most economical and efficient fashion and at the lowest cost, and in developing the most efficient and most economical types of terminal equipment, or an intermediate amplifying device to make use of this band of ether transmission which the pipe structure gives you.

Assuming a pipe two inches in diameter, of the kind that I have referred to, would have roughly a capacity for transmitting a band of frequencies, as I remember it, about five million cycles wide. Not quite all of that band is utilizable. The lower end of it might not be quite utilizable. Certainly a band four million frequencies wide would be entirely utilizable for telephone or telegraph channels. And, if you
2132 take the width of the ordinary telephone channel as about twenty-five hundred or three thousand frequency wide and make allowance for the fact that you cannot bring these channels absolutely together, have to make some allowance, you have certainly the possibility in a pipe of that size of getting at least a thousand independent normal telephone speech channels at the same time and without interference with each others.

I said a thousand telephone channels. In the present state of the art, to utilize those for two-way speech, you would have to divide that in two, you have the possibility of getting 500 ordinary two-way non-interfering speech channels through that; at least that number. That, too, would be utilizable for telegraphic communication as well as telephonic. If you
2133 used the thing exclusively for telegraphic purposes, you would get some twenty-five or thirty times as many telegraph channels as you have telephone channels, so you would

get somewhere from twelve thousand to fifteen or twenty thousand through it at the same time without interference. It could be used quite easily partly for telephone conversation and partly for telegraphic conversation at the same time. It could be used for still other purposes in addition to telephonic and telegraphic, such as the transmission of music. It could be used for the transmission of television.

Not all of those uses are capable of being applied to the same telephone circuits. Some of them are. The telegraph
to which I referred is possible over telephone circuits
2134 of the ordinary character, which are employed in the giving of two-way telephony. The transmission of high quality music, or high quality speech, such as is employed over wire circuits connected with radio broadcasting stations is not possible over the ordinary circuits employed in two-way telephony, except where they are very short. They require a special kind of circuit. It is a telephone circuit, to be sure, but it is a special kind of circuit, which has a very much broader frequency transmission range. When you come to things like television, of course, it is quite impossible to even conceive of those kinds of currents being transmitted over ordinary telephone circuits.

Ordinary speech, which we make with our mouths and hear with our ears, involves sound waves which are complex assemblages of waves of a large number of frequencies, but
they fall within a range, which, at the lower end, is
2135 measured by, we will say, a few cycles per second, a few oscillations per second, and at the upper range, in ordinary speech, by a number of thousand vibrations per second. Now, to transmit intelligible speech, whether it be in the direct transmission such as I am employing here, or over a telephone circuit, the transmitting medium must be capable of transmitting that entire band of frequencies, otherwise, you don't get intelligible speech; or you get speech which is very badly distorted. So it is a necessary requirement of all telephone circuits which are used in speech transmission that they be capable of transmitting all, or substantially all of the frequencies which are involved in the sounds which are

produced when one speaks. And they must do that without substantial distortion of any of the frequencies. That means, then, that every telephone circuit must in some way provide that kind of a channel. Now, as you increase the number of frequencies which you must transmit, as you do in the case of music where important frequencies are away above the ordinary voice range, you automatically widen out the band of frequencies, and so impose an added requirement on the transmitting medium, whether it be the air or whether it be a
2136 wire, or a radio channel, or what not. When you get to things like the so-called television, where the number of frequencies is enormously great, you have the requirement of a tremendously wide band of frequencies which must be transmitted without substantial distortion if the end result is to be what you anticipate.

We meet that added requirement of width of band for transmission of music in the telephone plant by specially engineering and equipping the circuits which are employed in the transmission of that kind of material. Those circuits are adequate for the giving of ordinary two-way telephony, they give a very high quality of that, because they have this wide frequency band characteristic. The circuits which are provided by the Long Lines and the associate companies in the transmission of program material for radio broadcasting in these networks that are set up, are all specially created high quality telephone circuits having this wide band characteristic. That is true with regard to everything except the very short pick-up circuit, where the length of wire is so short that the amount of distortion would be negligible. As an illus-
2137 tration of how different these things are from ordinary telephone circuits, the ordinary telephone circuit, whether it be a long distance, or a local circuit, will quite readily transmit a band of frequencies of twenty-five hundred or three thousand, starting at the lower range and going up. The program circuits which are provided have a band transmission characteristic of eighty-five hundred or nine thousand as the range. In other words, they are three times as good, if you like, as the ordinary telephone circuit, or put

another way, each one of those would be capable of transmitting three telephone messages at the same time.

This concentric conductor that I have spoken of is capable of being used for a great many bands of small widths such as telegraph bands or a less number of wider bands. It has complete elasticity, that is, you can chop up this spectrum of four million cycles into pieces of whatever width you desire.

It has the characteristic that you can manipulate and
2138 obtain any combination or arrangement within its inherent capacity of four million cycles, we will say, without making any alteration in the physical plant itself between the terminals, or alteration in the intermediate amplifying device; merely by making modifications in the terminal equipment. In other words, if and when we have a plant involving that type of structure, if today we want to use that for ordinary telephone speech and tomorrow we want to use it for high quality transmission, all we have to do is to change the terminal equipment at the sending and receiving ends. So far as the conductor itself is concerned, no change would be necessary at all. That, of course, is not true of the ordinary wire telephone circuit. To produce the type of broadcast transmitting circuit which I have described at the present time, modifications in the connecting wire plant have to be made both as regards the repeater amplifier units which are involved in that and in the arrangement of the wires and their accessories.

In my opinion, there is a prospective use for that new discovery in the Bell System in the near future. I think
2139 there is prospective use for it, particularly in connection with new plant, both in the fields of the Long Lines and the associate companies. Looking at a time ahead, I should say there is relatively more use in the plant of the associate companies than in the plant of the Long Lines. Of course, you will appreciate that I am having to project myself somewhat into the future, but I am doing it because of my knowledge of the inherent characteristics of this new thing which has only recently come clearly into our art, and it is of a character which makes it available for use over distances

which are such that it will be a substitute for existing types of plant now employed very largely by the associate companies and also by the Long Lines.

With regard to this ultra-short wave length transmission that I referred to, there is a limitation at the present time as to the distances over which that can be used successfully; not only at the present time, but to some extent fundamentally as to all time, as far as we can see. The limitation is
2140 simply the limitation which inheres in the fact previously referred to that it is a short wave transmission which can be directed. Because it is ultra-short wave it is a type of radio transmission which approaches in its transmission properties the character of light, which is a straight line transmission. The result is that the maximum distance which you can hope to go between transmitting and receiving stations is the distance that you can see the transmitting station from the receiving station without the curvature of the earth, or some large earthy mass, like a mountain, intervening. That is unlike the regular radio waves. These go in a straight line, and if they hit anything they are stopped.

I should assume that on a level prairie country, with transmitting and receiving structures of moderate height, the maximum distance possible to send these ultra-short waves at the present might be forty or fifty miles, whereas, if you had a station like might obtain in a mountainous region, or does obtain out in the Hawaiian Islands, where you have high
2141 mountain terrain separated by the curved surface of the ocean, it might go several hundred miles. So far as I know, there is no limitation of distance for these ultra-short waves, assuming that you get the right amount of energy imposed by the fact that they are short waves. The limitation of distance is imposed by the physical conformation of the earth in that these waves go straight.

The field of radio, together with our kindred investigations in subdivisions 5, 6 and 7 has furnished us with useful tools in connection with our wire communication business. A few of the most important of these are:

The work which is comprised in these three divisions of

our classification to which I referred has, of course, provided us with the vacuum tube and all of its development, which found an immediate and large field of application in the wire plant as telephone amplifiers or repeaters. It has furnished us with the so-called filter circuits, which enable us to make these splitups about which we have just been talking,
2142 of a wide channel into narrower channels, that is, using the same wire for a number of different conversations.

The work in these classifications has given us the entire so-called carrier telephone and telegraph art by which we can superimpose, even on our existing wire plants, a considerable number of telephone and a larger number of telegraph messages.

Also it has given us all of the tools for modulating, amplifying and detecting high frequency currents. It has further furnished us with a tremendously valuable aggregation of tools to be used in the development of all kinds of electrical equipment and apparatus and circuits. It furnishes us such things as the photo electric cells which are at the base of television and at the base of picture transmission and at the base of a considerable number of arts. As a matter of fact, the entire structure of the research laboratory has been completely altered by the coming of the things which have grown out of the work in these classifications.

Substantially all, if not all, of the developments which
2143 created the present day vacuum tube out of the original De Forest Audion tube, which was itself not available for any of the uses to which I have referred, were the result of the research of our department. The whole of the filter art came from our department.

In connection with that, there is one other thing that has come out of this work that I just recollect, and that is the development of the crystal oscillators as a means for accurately controlling high frequency current. That art has largely come out of our work, not the original idea, but the development of that idea for the multitude of uses to which we are finding it applicable. All of our work in the preliminaries of television and the amplifying devices for public

address systems came from our department. There are a tremendous host of things which have come out of our work. The tools which I mentioned yesterday are applied in all parts of the plant.

2144 Ordinary telephony involves the transmission of the frequencies involved in ordinary speech at their regular level of frequencies over a number of wires between the transmitting and receiving stations. With the advent of the perfected vacuum tube, filters and the other things in the art of these three classifications to which I have referred, which are utilized in radio telephony, there was given into our hands a tool to make possible the transmission, over a single pair of wires, of more than a single telephone message, without interference with other messages that might be on that pair of wires. In other words, a tool to open up the possibilities of utilizing the wire plant for many messages, where before only one pair of wires had been given, and that is what we call carrier telephony. Now, that tool consisted in the production of a high frequency current, or high frequency currents, if we have more than one carrier message superimposed, which frequencies are normally above the frequency which the ear can detect; in other words, they are inaudible. Then, by suitable use of filters, vacuum tubes and the auxiliary appa-

2145 ratus of this art, we take ordinary speech as it comes from the subscriber's station and superimpose it on this high frequency current—modulate it, as we call it—and then put that modulated current, or, if there are more than one channel, as is the case in most of this carrier work, put these modulated currents together with the original speech on the pair of wires, and send the whole conglomeration down the wire to the distant end, where the ordinary speech goes, just as ordinary telephony does, to the desired party, and the carrier speeches have these carrier currents taken out of them, and they are then reduced to ordinary speech such as they started with, and they are delivered to the separate subscribers.

The same principle is applied in carrier current telegraphy, except in that case the number of non-interfering messages is

usually much greater than in telephony. This is so for the reasons that I have described in connection with the concentric, that is, inherently narrower bands of frequency are required for telegraphy. These carrier methods are
2146 very largely in actual commercial use in the plants of the Bell System companies and in that of the Illinois Bell.

The first commercial use of carrier current was made at about the time of our entry into the war, on a circuit between Washington and Pittsburgh, a distance of about 400 miles. We had had experimental applications before, but that was the first commercial application.

This method of carrier telephony resulted substantially altogether from our investigations in the field of radio and of the two subdivisions 5 and 7 on my sheets.

Before we could have a successful carrier transmission, we had to have some of those specific tools of which I spoke as coming from our radio studies, principally the vacuum tube in all of its forms and for all of its uses, and filters. There
2147 are, of course, a considerable number of auxiliary things which have come from these arts, but those two are the principal things which made carrier telephony and telegraphy possible.

The filter is an arrangement of electrical wires and other pieces of electrical apparatus in the form of a circuit, which has the characteristic of transmitting only certain desired frequencies or ranges of frequencies, and of refusing to transmit all other frequencies. For example, it can be made so as to transmit with substantially 100 per cent efficiency all frequencies from zero up to some predetermined limit, and reject all other frequencies; or, conversely, it can be made to refuse all frequencies up to some point, and transmit all others, or it can be made to refuse all frequencies up to some point, and reject all others above a higher point, and transmit the band in between; or it can do the reverse of that. In other words, it is a device which grew out of our studies in these arts, which gave us what you might call the gates by which we could let things into a pair of wires, or take things out of a pair of

wires without fear that other things which were on that pair of wires would produce interference.

2148 One of the uses of the filter is the separating of the various currents that are on the wires so that each message will go to the person for whom it is intended. At the other end of the circuit, it is the means by which those messages are assembled on the wires. This was invented by Mr. George A. Campbell of the Department of Development and Research. It was invented primarily as a radio device, but it has found its greatest application in the field of wire telephony and telegraphy.

The experience with the circuit between Washington and Pittsburgh in 1918 to which I referred a moment ago indicated clearly the practicability of this type of telephone transmis-

2149 sion, by which the wire plant could be made to carry many simultaneous non interfering messages. The work in the further development was vigorously pursued, not only to extend the number of circuits over which this method could be applied, but also to reduce the cost and complexity of the apparatus required and the maintenance charges.

2150 A number of succeeding types of carrier systems followed in the years succeeding 1918. By 1923, I think, we had reached the stage of about a third of these developments of modified large forms of carrier. My recollection is that the first of the so-called type C carrier systems was installed in 1924, which means that it must have been developed along in 1923. Up to that time, this carrier telephony had been used substantially entirely on the longer toll lines of the Bell System, which meant the lines of the Long Lines Department and the longer toll lines of the associate companies. If the art had stood still as of that date, and we had made no further developments but had had available the art as

2151 of that date, it would have had a large usability in the plants of the Long Lines and the associate companies in the longer open wire circuits.

Since 1923, our work in connection with this subject has been mainly directed to the end of extending the range of applicability of this method of transmission, not only by

improvements in its inherent characteristics, but also through the improvements which increase the efficiency and decrease the first cost and operational cost of the equipment.

In connection with the development of this carrier method, there have been different types of systems developed. The original type, that is the 1918 type, to which I have referred, was called type A, and the subsequent ones have been lettered alphabetically. Type A continued in use for only a limited time, and type B came in rather shortly after the installation of the first type A. That installation was quite efficient,
2152 but it was a rather expensive type of installation, and very shortly a multi-channel type with much improved apparatus (the type B) came into existence. Both types A and B were developed before 1923. We have gone two steps further down the alphabet.

As I have indicated, type C, as I remember it, was developed about 1923; I think the first installation was in 1924. Type C is still in general use. Type D has been developed since, and is in general use.

At the end of 1930, there were about 450 installations of type C in general service. About two-thirds of these installations were in the plant of the associate companies and
2153 about one-third in the plant of the Long Lines. By that time, types A and B had substantially gone out of use. I don't know exactly when the last of them went out; it may be that there are one or two somewhere still operating.

By the end of 1930, there were approximately 600 installations of type D in service. Of these, all but 4 were in the plants of the associate companies. I don't remember exactly when the D type was first introduced, but it was some time considerably subsequent to 1924. My recollection is that it was about 1927. It was a few years prior to 1930. The growth of that system has been extremely rapid in the plants of the associate companies because of its great availability for their type of plant and service. In recent years, the
2154 growth of that system has been many times as great in the plant of the associate companies as in the plant of the Long Lines.

Our research in the field of carrier current wires has led us to the research and development with regard to the use of the principle in connection with cables.

Initially, as I indicated, the application of this carrier art was confined to non-loaded open wire structures, essentially to long lengths, and in the early installations only a limited number of wires or pairs of wires on a pole line could be equipped with these facilities because of interfering effects. As the system and methods were developed for the arrangement of the wire plant, it became possible to extend the use, not only on shorter and shorter circuits, but also to apply more of them to pole lines; but still we were not able to employ this form of transmission to cable circuits because of the then existing inherent characteristics of those cable circuits.

However, the desirability of being able to do this, namely, to operate carrier on cable wires, was so great that we
2155 spent a large amount of energy, time and money in an attempt to solve that problem, and we have substantially solved it so that we are now able to use the carrier principle on cable circuits, that is, on pairs of wires encased in lead pipes.

We are now in a position to use it. That is, we have carried our experimental development work to the point of having actually in operation a trial experimental installation of which this is the principle of operation.

My opinion is that this development will have a very considerable field of use in the future in all of the companies, that is, both in the plants of the Long Lines and in the plants of the associate companies. As to the exact ultimate length of circuits over which it may be applied, I cannot, of course, say with exactitude, but I have no reason to doubt that the field of its first application will be on circuits of inherently short length.

These carrier systems have advantages other than the
2156 multiplying of the number of conversations that may be carried on simultaneously and without interference over a single pair of wires. They have the same kind of advantages, but in a more limited amount, that I have described in

connection with the so-called concentric conductor; they have all of the advantages.

In connection with vacuum tubes, I have already explained in general the uses in the telephone plant. They are employed in all of our telephone amplifiers and repeaters, and all of this work which makes carrier telephony and telegraphy possible, whether over open wires or cables, in the whole field of radio, and in many of the measuring devices which are employed. The device itself involves a heated filament, a high-vacuum, and some terminals enclosed in the containing tube, a device which in one form is familiar to everybody
2157 who has a modern radio set. Its primary characteristic is that of enabling one to control, without distortion, a considerable amount of locally produced energy, with a very small amount of energy from some distant source. In other words, its primary characteristic of great value inheres in its amplifying properties. That is, we can take a voice current that is very weak and, with the use of this vacuum tube, make it very loud without destroying its qualities at all, and without distorting it.

Mr. Lee DeForest invented the vacuum tube. He patented it about 1908. The American Telephone and Telegraph Company shortly thereafter purchased rights under that patent, and ever since that time our department has worked on the development of those tubes. In the form in which DeForest developed it, the vacuum tube was not usable at all in the telephone system, for the reason that it would handle
2158 not even the small amounts of energy which are involved in commercial telephony. The first thing that had to be done before it could be usable at all was to remove that inherent limitation in the DeForest tubes. This was removed by simply producing a very much higher degree of initial and permanent evacuation of the tubes; that is, making the vacuum substantially perfect. This was a development of our department, and the so-called high vacuum tube is the present day foundation of a dozen or more different branches of the telephone art.

The first development was the one I have just described,

of making the tube capable of handling larger amounts of energy, and of making the tube more stable. From that point on, the developments took a number of different direc-
2159 tions. In one direction was a large series of developments looking to the production of a filament which would produce large quantities of electrons (the electrons being the working part of the vacuum tube) with a high degree of uniformity and at the least possible cost. And beyond that came a series of developments seeking to enlarge the capacity of the tube in the sense of handling greater and greater amounts of energy, and a large number of collateral developments concerned with vacuum tubes of particular characteristics, for particular purposes.

We have been able to make very considerable progress in all of these things, particularly with regard to the matter of the electron emission filament thing, and particularly with regard to the size of these vacuum tubes. Whereas the first DeForest tube, as I have indicated, was incapable of handling even the small amounts of energy which are involved at amplifier stations, it is now possible to make vacuum tubes with essentially perfect characteristics which will handle hundreds of horsepower of energy.

In the case of the developments relating to the filament, even the first types which we ourselves made of a character which was suitable for use as telephone amplifiers, the filament was a relatively short-lived affair; it probably
2160 would not last, on the average, more than 1,000 hours of service; it took about 1½ amperes of current just to heat the filament up to the point where it would emit the electrons. Those early tubes cost $8 or $9 each to make. At the present time, the tube for corresponding service has a life in excess of 20,000 hours, or 20 times as long. It costs, roughly, one-third of the price of the tube of the earlier art (between $2 and $3), and the amount of current which is required to heat the filament, instead of being 1½ amperes, is about ½ an ampere, or about one-third of the energy formerly required.

So that, from the standpoints of the length of life, the initial cost of the tube, and the cost of operating the tube in

whatever place we use it, tremendous reductions have been made. In addition to that, all present day vacuum tubes which we use in our repeater plants and other places are essentially stable during the period of their usability, that is, they have uniform characteristics as long as they are usable at all, whereas the earlier tubes did not have those characteristics.

2161 The effect of these improvements has been to greatly extend the field of use. For an example of the extension of this field of use in the Bell System, I will take the case of telephone repeaters, which was the first field of use of the vacuum tube; it has enormously extended its use in that field.

The first application of these vacuum tubes as telephone repeaters was in the so-called transcontinental telephone line which was installed in 1915, and at that time the art was such that telephone repeaters were available only on long open wire circuits. By that I mean that they could be used on physically relatively long wires, and were of such operating cost that they were not attractive for shorter wires, even had we been able to use them. Each time a reduction in the cost of the tube itself and in the incidental apparatus which is concerned in its application as telephone repeaters was made, it opened up wider and wider fields of economical use in the plant.

2162 From the first set of installations in 1915, the use of these repeaters extended quite rapidly. By the end of 1920, we had about 1,000 repeater installations in service, practically all of which were in the plant of the Long Lines. Five years later, that is, by 1925, that usage had grown to approximately 7,500, of which about one-third were in the plants of the associate companies. By the end of 1930, the total number had grown to about 81,500, of which still about one-third were in the plants of the associate companies, and about two-thirds in the plant of the Long Lines.

As the improvements are made in that vacuum tube, and as reductions in cost occur, they will increase the rate of growth of tubes in the associate companies more relatively

than in the case of the Long Lines. That is so because, in the use of repeaters in the very long lines of the asso-
2163 ciate companies, it has already reached well on towards the point of saturation, as determined by the length of the circuits. The Long Lines Department has essentially long circuits. It has no circuits under 40 miles. Consequently, further reductions in the length of circuits over which it is economical to use repeaters will not substantially affect the Long Lines. Their increase in use will be measured substantially by increasing numbers of circuits; that is the ordinary growth factor. Whereas, in the case of the associate companies, they are affected by that factor also in the circuits on which they can now use repeaters, but the studies and research and development work which is still continuing, and is continuing to decrease the length of circuits on which it is economical to employ repeaters, in addition opens up fields of use in regions not hitherto available to the application of repeaters, and of which the associate companies have very large numbers. That new field of use is practically confined to the associate companies because it involves circuits under 40
2164 miles in length. The rate of growth of repeaters in the plants of the associate companies in the two years 1928 to 1930 was double the rate of growth in the Long Lines.

I expect that characteristic to continue with the further development of the tube, and the further reduction of its price, although the sum total amount of reduction of length of the circuit which is possible is not so great as it once was, obviously. That is, the present state of the art has reduced the length of open wire circuits on which it is economical to use repeaters to something in the neighborhood of 35 to 50 miles, and on cable circuits it has reduced it to something on the order of 10 miles.

In addition to the uses of the filter which I have already described, it has further uses in the Bell System. I have described its use in connection with things like carrier current, but it has found a field of application in a large number of other places. For example, it is employed in connection

with the elimination of deleterious currents, from the charging circuits which we use in supplying current. It is
2165 used, not in our plant but in the plants of power, light and railroad companies, the circuits of which tend to produce interfering disturbances in our circuits, as a means of eliminating those disturbances, eliminating them from being present on the wires which are in inductive relation to our wires.

In particular, in recent years the street railway art was very materially changed by the introduction of the so-called mercury arc rectifier as a means of producing direct current to supply the trolley wires direct from alternating current without the necessity of introducing the use of rotating apparatus. But the first introductions of those mercury arc rectifiers bade fair to wreck the service of the local telephone companies, because of the vast amount of high-frequency induction. That problem has been solved by introducing filters which we have made available to the street railway people, or the manufacturers of that kind of apparatus, and in the specific development of which we gave them the benefit of any advice which we had. That is, we procured the installation of these things in their plant as a protection to ourselves. For that particular kind of trouble, it is imperative that the source of the trouble be eliminated. It is noth-
2166 ing we can cope with in our plant, once it is introduced in our plant, because it is in the voice range.

Now, filters are used in numerous other places. One place where they are used to a considerable extent, and bid fair to be used to a much larger extent, is in connection with the elimination of the noises which are produced in subscribers' radio receiving sets whenever, say, the dials of dial telephones are operated, or frequently when they are operated, an objectionable type of noise, and one which, before the introduction of filters (very simple and cheap filters) into the subscriber's set itself, was a very difficult thing for the telephone companies to consider coping with. In some cases, it would have been very expensive to cope with it. But, by the introduction of the filter art into that part of the plant, we have

developed the means for handling that kind of problem very simply and cheaply.

These two uses of the filter (that is, to protect against trolley currents and to protect the radio receiving sets) are substantially all in the plants of the associate compa-
2167 nies because it is in their plant where this difficulty occurs mostly.

In addition to the devices which I have described as actually in use in the plants of the local operating companies and the Long Lines as a result of our studies of the vacuum tubes, filters, radio and other subjects under sections 5, 6 and 7 of my analysis of expense by classes of work, there has been indirect effect of that work upon the plants of the various operating units of the Bell System.

In an earlier answer, as related to all or some of these things, I referred to some of the indirect results which have grown out of this work in the production of new laboratory tools which we use to create new things.

The coming of the vacuum tube and the other items of these three classifications has completely revolutionized not only the way in which we do the research and development work on practically everything with which we are concerned, but has resulted in our ability to develop things which we could not otherwise have developed, and to improve the characteristics of many of the things which existed before, simply because of the fact that it has given us very accurate
2168 yardsticks or measuring instruments with which to judge the effects of our work.

Also, some of these devices like the filters, have made it possible for us to investigate characteristics which are fundamental in the design of apparatus or equipment or systems of circuits by the process of segregating the whole band of frequencies which are involved in speech transmission into narrow bands, or bands of any predetermined width, and finding the effect of the individual parts; whereas, before the introduction of filters and vacuum tubes, we had to make our examinations wholly by the over-all effect, without any ability to go into the individual factors which made up that result,

now we are able to dissect and measure the influence of the parts, and to dissect and measure the influence of modifications, one at a time, which we make.

For example, when I first went into the business, and for many years thereafter, when we were attempting to develop transmitters or receivers or circuits or anything involving speech transmission, the only measuring tools which we had were our ears, and the only sources of the currents which
2169 we measured were the sounds produced by our voices.

And, since those were composite sounds in their production, and since the ear could measure only relatively gross variations of these composite things which it received, the only way that we could get any accuracy in the determination of the efficiency of a piece of apparatus was by a tremendous number of repeated tests, by the statistical method, and the individual variations in those observations might be enormous. The net result of that was that not only were certain kinds of development barred to us, but even where we could make development, the end result was so concerned with the uncertainties of the measuring implement that, in order to insure against deleterious apparatus, or inefficient apparatus getting into the plant, we had to make large allowances, and consequently the plant was, on the average, not as efficient as we knew it might be, and was certainly more expensive.

Now, that whole thing has been changed by the coming of these new devices. And, more than that, the coming of these devices has enabled us to make that analysis of speech and the production of speech sounds, and that analysis of the ear and of the effect of various parts of the frequency range on the efficiency of hearing, which are fundamental to the
2170 design of everything in the telephone plant.

The telephone plant, in the last analysis, is measured by its ability to interpret speech sounds, to transmit them, and to reproduce them for some distant party to hear, so that, by the use of these new tools which enabled us to go clear back into the fundamentals of speech and hearing, we have opened up an entirely new realm of possibilities which we have adapted in the development of highly efficient apparatus,

systems, circuits and equipment of all kinds, throughout the plant. You can hardly go into a room in the research laboratory today without finding some or many of the elements of the art of these three classifications there employed as accurate measuring tools. That is certainly true of the electrical parts, and is largely true of the parts of the laboratory devoted to mechanical things; so that the indirect results of the techniques alone have had a vast influence everywhere in our development work, and their results appear in all of the classifications that are shown on these sheets, in so far as those classifications relate to physical things.

That is, this matter that I am now referring to is the ability that we have now to improve the parts of the plant that
2171 are old through the means of these new measuring instruments, to develop entirely new things, either to take the place of old things, or to supplement those old things. What I was trying to convey was that in some classification which appears to have no connection with these three classifications, work is done and results are obtained which could not be done, or the results not obtained, were it not for the tools which are provided by the arts covered by these three classes. That is one of the reasons why, at the beginning of this examination, I said that these three arts are so fundamental that they underlie all that we do.

I can mention some specific illustrations where our improved design and method and measuring technique have resulted in improved apparatus in the plants of the local companies. Take, as an example, the modern handset, which has become so much a part of the telephone plant, the instrument in which the transmitter and the receiver are assembled together in a rigid handle. If it had not been for the
2172 techniques involved in these three classifications, it would not have been possible for us to develop that instrument with its high efficiency and quality characteristics, characteristics which are required if it is to be introduced into the general telephone plant of the Bell System, or to assemble those together in the rigid handle which makes up their

mounting, and to give to the instrument its essentially positionless effect; that is, its efficiency, irrespective of the position in which you hold it; the old desk set instrument was usually held in upright position, and if it was not, its efficiency would be very much impaired.

You could not take the transmitter and the receiver on the old desk set and put them together in a rigid handle, to give you the handset. That was so partly because of this positional effect, and partly because of the structure of the transmitter, particularly. The structure was such that when you tried to put that particular transmitter into a handle and maintain its efficiency, you had great tendency for the instrument to do what we call "sing", that is, to produce a
2173 sustained note determined by its own natural period, the same phenomenon that occurs with an ordinary desk stand if you take the receiver and put it in front of the transmitter.

May 11, 1932.

2175 Among other illustrations which I had in mind were some which I have previously referred to, but which I will here repeat. For example, I mentioned factory and repair shop instrument tests, which have grown out of the application of this technique, and which make for a more uniform output of new and repaired instruments. The same thing also with regard to field measuring instruments, which enable the telephone companies to operate and maintain their local plant with a higher degree of certainty, efficiency and economy. The use of these tools and techniques also has permitted us, as I have referred to before, to engineer the plant on a more improved and accurate basis.

Then specifically with regard to the improvements in the elements of the plant, it has enabled us to develop improved types of station equipment, which bid fair to have a very wide application in the plant; specifically what we call
2176 the anti-side tone circuit, which will make it possible for us to use instruments of the maximum transmitting and receiving efficiency, with a minimum amount of what is

known as sidetone, which is the effect of the feed back from the transmitter to the associated receiver. That has a double advantage, in that it tends to remove the interference of the speaker with his own hearing and more particularly it has the effect of eliminating, or minimizing the effect of noise where the instrument is in noisy places, and makes the efficiency of the instrument very much greater.

These tools and techniques have also had the effect of enabling us to design and make very much lower cost loading coils, which are largely used in the inter-office trunk plants of the associate companies, in their local exchange areas; and the same thing applies to the design of improved systems of loading, enabling us to transmit wider bands of frequencies, and so better the quality of the transmission.

They have also, as I think I have referred to before, put us in a position to develop higher quality transmitters and receivers, or, in other words, to improve the transmitting
2177 efficiency of the receivers and transmitters from a quality standpoint, that is, from the standpoint of distortion elimination. This is an extremely important thing because of the fact, which I mentioned before, that in the last analysis the aim of a telephone system is to give as nearly perfect transmission as it is physically and economically possible to give, and we have been and still are quite a distance from the ultimate, which we have felt was a desirable goal, and which the introduction of these tools has enabled us more closely to approach.

Then there is another very large field in the local exchange plant, which has been materially benefited by the introduction of these new tools, and that is the ability which they have given us to build a better balanced local exchange plant. By that I mean, a plant which is better balanced from the standpoint of its susceptibility to picking up extraneous interfering currents such as those produced by electric light and power installations, street railways and what not. The ideal of a telephone system operated in proximity to interfering sources would be a perfectly balanced plant in which interfering electro-magnetic disturbances would not produce the sound

2178 effects in the receivers of the users of the service. The use of those tools has not only enabled us to find ways and means of bettering the plant construction itself, but of locating specifically the places in which this interfering disturbance occurs, and so eliminating it.

Then there has been the interaction, or the reaction of the whole filter art, which I have previously testified to, on the acoustical and mechanical parts of our transmitters and receivers. The development work in connection with the filter art showed us how to segregate portions of the electrical circuit within the frequency band, into whatever parts we wanted and to study those separate parts as to their influence on the whole. It also showed us that since mechanically vibrating systems are analogous to electrically vibrating systems, oscillating systems, the same general rules could be applied to mechanical systems as they appear in transmitters and receivers, and we have been enabled by the extension of this filter art to improve the acoustical and mechanical parts of the transmitters and receivers, which, of course, are at the heart of the business, and are the things primarily used in the local exchange plants.

I have already referred, I think, to the case of the 2179 extension of our knowledge of the filter art to its application in the dial system, sub-station instruments, where the operation of those instruments tends to produce objectionable noises in adjacent radio receiving sets, and where, through the use of this art, we have found a feasible and reasonably economical way of obviating that kind of trouble, which was very serious, and bade fair to be more serious, and very very difficult and expensive to obviate without some such thing as we have gotten out of the filter art.

There were handsets in use in Europe for many years. 2180 The difficulty in using them in this country was found in the high efficiency of the transmitters and receivers which were the standards of the Bell System, and those standards were, roughly, the standards of all telephony in this country. Wherever handsets outside of the United States were employed, the efficiency of the transmitters and receivers

had been sacrificed for the sake of convenience, that is, for the sake of the convenience of having the transmitter and the receiver mounted in a rigid handle. I think at some time or other I indicated that a transmitter and a receiver associated together in a rigid handle, and connected to a source of power, have a tendency to vibrate in their own natural period, or to sing, as we call it, to produce a noise which not only is
2181 objectionable, but which destroys the efficiency of the transmitter. That is characteristic of any electromechanic vibrating system to which power is applied, and the higher the efficiency of the transmitter and the receiver, the greater is this tendency to sing. With the very high efficiencies of the transmitters and receivers which were standard in this country, and on which the whole plant of the Telephone Company had been engineered, this tendency was very great; and we found it impossible to associate those two instruments together in the form in which they were normally used in a rigid handle, without producing this deleterious effect, and we could not do what they had done in other countries, degrade the efficiency of the sub-station instrument for the sake of convenience, without completely deteriorating the whole basis of telephony.

So our problem was that of finding ways and means of designing transmitters and receivers of efficiency as great as was needed to maintain this general efficiency, and at the same time which were susceptible of association together in a rigid mounting. That problem was one on which we worked
2182 for many years, but which we never were able to solve until we had the facilities afforded by the tools of this art covered by these classifications.

The matters which I referred to in all of the 12 classifications which I have mentioned are in actual use today in the Bell System. They are in use in all parts of the Bell System, but those illustrations which I have given are primarily in use in the plants of the associate companies, and primarily, also, in the plants of the local exchange areas. Many of them are only in use in the local exchange plants. Some are confined to that particular class of plant and others are general

to the whole System. The handset, for example, is purely a local exchange affair. This matter of the anti-side tone circuit, the type of loading coils to which I have referred, the work which is being done in connection with improved transmitters and receivers, of course, are all essentially local exchange plant affairs, and confined to that class of work. Some of the others have wider application.

2183 These 12 matters to which I referred have reacted most beneficially on the general design of the plants of the operating companies as a whole. They have reacted on the design to better it, largely to cheapen it, and to make it more reliable and satisfactory in giving the telephone service for which it is intended.

I have mentioned some specific matters where they have reacted on the plants and resulted in a decrease in cost; for example, the development of those much cheaper loading coils which are used in large quantities in the inter-office trunk plants of the local exchange areas; the whole matter of balanced plant to minimize or eliminate the effects of extraneous noise has tended to cheapen the construction and make more reliable the construction of the plant in the local exchange area. Those improvements have had an effect upon the kinds of wire used in the local exchange plants and elsewhere. They have had the effect of making more avail-

2184 able the economies which reside in the development of the so-called fine wire cables by making it possible, without reduction of transmitting and receiving efficiency, and, conversely, with an improvement in the efficiency, to use a cheaper connecting wire plant such as the type of plant provided by the fine wire connecting plant I referred to.

We commonly refer to fine wire in our connecting plants as wire of less than 22 gauge, that is, specifically, 24 and 26 gauge. The Long Lines Department does not use any conductors of that class. They are to be found wholly in the subscriber's loop and inter-office trunk plants of the local exchange areas. I have never made any specific study to determine the economies that have flowed and are likely

2185 to flow from the extension of the use of fine wire as to

any actual difference, but it is perfectly clear from the character of the cable which is made possible by this, and the extent to which it is employed, that those savings are measured by many millions of dollars.

These developments to which I have referred are still proceeding.

On the basis of the new technique and the new devices which we have already developed along the lines stated, there are further substantial economies which it is now actually contemplated introducing into the plants, and this introduction is one for the near future.

The matters to which I have referred do not constitute all or even most of the improvements that have been introduced in the plants of the local companies by reason of our
2186 knowledge gained through the development of the vacuum tube device and the art that has been developed thereon. What I have mentioned have been merely illustrations.

There are important prospective uses of our knowledge and development under classifications 5, 6 and 7 which have not been introduced into the plant to any substantial extent.

In the course of answering questions, I have indicated a considerable number of specific applications and incidental values; specific applications of the things that have come out of this art, and the incidental values which have resided therein; but I have not, so far as I remember, touched upon a field in which there are large prospective values, but in which we have made no beginning at all in introduction, or have made only a very slight beginning. For example, I think
2187 I have mentioned the introduction of such things as the actual use of devices as amplifiers in all parts of the plant; but there are other uses for these amplifiers or repeaters, as we call them, particularly in the plants of the local companies, the local exchange plants, where we have either not made as yet any material application, or have made only a very limited amount. Illustrations of that would be the use of automatically switched in repeaters, in the handling of long inter-office trunk calls through manual or step-by-step central offices; that is, an automatic dialed call from one office

destined for a distant office, to which there was not interstate traffic, passing through an intermediate office, would have repeaters automatically switched into the connection at this intermediate office, to provide the necessary grade of transmission; and such repeater would automatically not appear in service if the call from the originating office was destined for an office in which it was not required. Now, that is a use which as yet is very limited, but which bids fair to be very extensive, because of the growth, and not only because of the growth of these dial type local exchange areas, but primarily because of our ability to utilize repeaters on shorter and
2188 shorter circuits. That business would be an intra-city business practically or, at least, an intra-local exchange area business, as city and suburban business.

Then similarly, there is the use of repeaters on long local and toll inter-office trunks, not automatically switched in, and repeaters on long station lines connected to private branch exchanges, of which there is a growing number, particularly where the private branch exchanges are large, and have many long lines; and on some of those, repeaters or amplifiers are available; and the same sort of thing on the inter-connecting lines between the private branch exchanges.

In many cases, the local companies are giving service to organizations which have more than one private branch exchange, because their business is located in different parts of the city, and they are connected by their own connecting trunks and, where these trunks are long, they afford the possibility of use of repeaters, and that use is a prospective large use, although at the present time it is not very great.

2189 Then, of course, there is the thing which is already in use to a considerable extent, and which bids fair to be a considerable use, the provision of special sub-station sets for those whose hearing is defective. In those sets, the receiving element is provided with an amplifier to raise the volume of the incoming sound to the point where persons can hear. That use is likely to be very considerable when you consider that 10 or more per cent of the population is affected with deficiencies of hearing.

Then there is the whole system, not yet touched at all, of program distribution through the wire plant of the local exchange areas; in other words, the distribution of news, music and entertainment, not by radio broadcast, but by wire distribution. If that service should come into the picture, of course, it would involve an enormous application of this art, strictly in the local exchange area. Our developments are such that we are equipped from a practical standpoint
2190 to conduct that kind of business at the present time.

I have noted down here a couple of other illustrations, one of which, while it does not involve a large number of these amplifying devices of this art, involves them in a widespread service in the local exchange area, and that is in the giving of time service, such as is in effect here in the City of Chicago. The giving of that service would either not be possible, or would be extremely expensive, if it were not for the use of these devices from this art, in the giving of that service.

This art has also provided us with the tools for an entirely new usage in the local exchange area, as in other parts of the system, in that the provision of the carrier system, by giving us the ability to assemble a multitude of communication
2191 channels on a given pair of wires, or on a single pair of wires, provides us not only with means for using those channels for actual speech transmission, but using them for signaling purposes. So it has opened up to us the whole field, a field not yet attacked at all, but which seems promising, of using the voice frequency or carrier method, particularly in the lower range of frequencies, for dial signaling, the carrying of the signaling current throughout the plant, where it is now carried by direct current.

Then there is a field of service which is of very recent introduction into the system, this so-called switched teletypewriter service, in which a printing telegraph service on a switching basis analogous to that by which telephony is given is being introduced; that is, the subscriber with one of these printing telegraphs asks to be switched to somebody else with whom he wishes to communicate, and the telegram is typed on the sender's machine and is repeated on that of the receiver.

That service was inaugurated very recently, within the
2192 last four months. It bids fair, if the expectations are at all realized, to have a widespread use, not only on interstate business, but on intra-city business; that is, if a large number of these instruments are on the premises of subscribers in a given city, they will be used not only for telegraphic communication to distant points, but for such telegraphic communication as is required within the areas of the local exchange; and this art provides much of the means which can be made available for that service.

In the same way, the use of this type of instrument is finding a field of application in the automatic recording of troubles in the telephone plant, particularly in the machine switching plant, where it is very difficult, or at least, has been very difficult, to locate a transient kind of trouble. This art has provided us with the means of making a permanent and definite record of where that trouble occurs.

Then there is the whole field, which has not yet been attacked at all so far as application is concerned, or almost not at all, of the use of this art and the devices of this
2193 art in the switching plant of the telephone companies, which forms so large a part of the telephone companies' equipment. These devices, particularly the vacuum tube, and the other thermionic devices which grew out of our studies of the vacuum tube (and they are very numerous, and increasing in amount and number all the time as our knowledge increases) have properties not alone of amplification without distortion, but they have properties which make them available for many other uses. And some of those properties make them available for application where, in things like relays, certain circuits have to be closed or opened, and where in the past the only way of performing that operation was through an electro-mechanical device. This art, and the properties of these devices which have grown out of it, are such as to indicate that the application in the field of switching may be very very large in the years immediately ahead.

The emphasis until very recently in the development of this art and the devices of this art, has of necessity been on the

side of their use as amplifiers rather than for other purposes. That was partly because there was an immediate and otherwise unsolvable urge to use them there, and partly
2194 because the quantitative values of these properties were not available until a large amount of research and development work had been done; so that that whole field which we are actively engaged in considering at the present time, you might say, has practically not been touched at all as yet. And it is the field primarily of the local exchange area, although to whatever extent these devices develop in that field, they will be used, or they will be usable wherever the switching of electrical circuits together is involved.

The things that I have referred to in these last answers will have their field of greatest application in the plants of the associate companies, and primarily in the plants of the local exchanges, rather than in the toll plants. Many of the things that I have referred to this morning have had to do wholly with the local exchange plant, and others are more largely concerned with that. This last element which I have just referred to, this element of prospective use in the
2195 switching field, of course, is essentially a use of the local exchange plant, because it is there that switching is done in vast amounts. With regard to that class of improvement, it would be confined wholly, or practically wholly to the local operating companies.

All of the matters to which I have referred are matters of importance and many of them will involve, when they come into use, apparatus of plant in large amounts. Of course, some that I have mentioned have to do with methods and techniques which in themselves do not involve large apparatus, but enable us to engineer, manufacture, install and operate the plant more efficiently and economically.

The transmission of music, entertainment, etc., over the wires of the local companies would be of advantage to
2196 those companies in that it would provide them with another use and source of revenue for the type of plant which they have installed for the giving of the ordinary telephone and telegraph service.

Considering all the uses and effects of the results of our studies and work under classes 5, 6 and 7; my opinion is that so far as the expenditures in these three classifications are concerned, as related to present benefits and prospective benefits measured in plant investment units, the benefits will be greater
2197 for the associate companies than for the Long Lines per dollar of plant investment. That is largely because many of these things to which I have referred have such an enormous application in the plants of the associate companies.

As indicated in Exhibit A-118, I have consolidated these three classifications (that is, 5, 6 and 7), and have allocated them on the basis of the total plant in service; that is, on the basis of the relationship of the Long Lines plant to the total
2198 plant. In my opinion, that method allocates to the Long Lines the full share of the expenses of our department under these classes.

The next column to the right indicates the expense allocated to the Long Lines in dollars for each of the classifications, using the basis of allocation indicated in the second column and applying the percentages indicated also in the second column.

The next column to the right is the difference between the first column to the left and the amount which I have allocated to the Long Lines.

2199 The fourth column of figures I have allocated to the Chicago area on the basis shown in the fifth column, in which the basis of allocation is indicated, and the percentages are given on the basis which the investment in the Chicago area bears to the total investment of the remainder of the System less Long Lines; that is, the Chicago area's portion of the associate operating companies. I have in each case used the same factor that is used for apportioning the Long Lines. The last column to the right shows the dollar result of applying the percentages of the preceding column to the figures of the column preceding that, that is, the fourth column of figures. I proceeded in the same manner

2200 with regard to each of the years dealt with on these sheets.

The sheet which is marked for identification as Plaintiff's Exhibit A-119 is a summation of the amounts of our expenses allocated to the Chicago area, obtained in the way which I have just described, because I have made a correction for credit against our expense involved in the non-associate sales of the Western Electric Company of telephone apparatus and lead covered cable. By "telephone apparatus" I use the expression that the Western Electric uses less what it calls its special commercial products. Now, in attempting to make an allocation in the way in which it is made in this exhibit, and for the reasons that have been indicated throughout my testimony, it was not possible to make a preliminary correction for any credit on account of these non-associate

2201 Western Electric sales because of the nature of the work done under the several classifications which spread all over the entire field of our work. In the original attempt to allocate, I was dealing with totals. I was not dealing or attempting to deal with classifications, which are the artificial divisions of our work for the purpose of executive control, and, as I was dealing with totals, I was at the same stage that I am now at with regard to this other method.

2202 That is, when I was dealing with the totals, I took off the total allowance for this Western Electric outside business, so to speak, first, and then allocated what remained. In this case, because of the split-up into classifications, I could not do that, so I found the amount that would be allocated to the Chicago area of the Illinois Company without deducting for the Western Electric outside sales, and then I made a pro rate deduction. That is what this sheet shows, and the figures are all taken from the other figures that appear in the other exhibits.

(Sheet marked for identification Plaintiff's Exhibit A-119, offered in evidence. Objections and ruling reserved.)

2203 Very little of the work that is shown on these sheets which we have been dealing with finds use in the plant

usually in the same year in which the work is done and the expense incurred. Usually it follows by a year or two years, or something of that kind, and sometimes more. A very small amount of the work covered by these sheets (Exhibit A-114) which are the work sheets, finds application or use in the plant or business of the operating companies in the year in which it is done or the expense incurred; a small amount of it does. Obviously, this item of the expense which we incur in connection with the rate case testimony is a very current expense, and in the same way some of the other classifications, such as the one on interference where a large amount of consulting work is done with the operating companies, involve a moderate current application. Our consultation work with the operating companies is work which they get the benefit
2204 of directly. Whether they can apply it or not, they get the benefit directly. Except for these kinds of classifications, the benefits from our work are available in the plants of the associate companies and the Long Lines at intervals ranging from a year or two, in the case of the kinds of work which are more nearly in the situation of actual immediate manufacture, installation and use, to very long periods in advance with regard to this more fundamental work. Some of it may not find its place in the plants for 10 years.

I should say that a much larger proportion of the expense incurred under subdivisions 5, 6 and 7 than in many of the other classifications was of the character which would find its place in the plant further after the time when the work was done. Of course, there is a classification covering fundamental studies applying to communication (I don't remember the exact title) which is of such a fundamental character
2205 that it may be a very long time in advance. There are also items in others of these classifications which are like the majority of the items under classifications 5, 6 and 7.

I have prorated our work on the basis of the plant existing in the years in which the work was done. I have already explained that in my attempt to prorate the expense of the Department of Development and Research on any basis, I found one base which seemed to me a proper one on which to

attempt a proration, and that is the base which involves the investment in physical things; because our work in the Department of Development and Research deals essentially with physical things, and not primarily with the operation of physical things or with the current introduction of those physical things. Therefore, the logical base, in my judgment, to use is a base of physical things. In the first analysis, I took the totals and took the entire base and that, in my
2206 opinion, is the most accurate allocation or base for allocation of work of this kind which can be used.

Now, having taken that base (and it would be true of any base that I might take), and having eight or ten such years to allocate, I am limited to the factors which appear in those years. I could not take factors preceding the year 1923 of plant values because I would then be dealing with a situation in fact at a time much antecedent to the period in which the value would obtain, and I cannot take the time following the present, because I have no knowledge of what those factors will be in the years ahead. Consequently, in any attempt to allocate these expenses between the recipients of the values in a year by year fashion, the only thing that I can do is to take the plant values as I find them in the year in which the expense is incurred, and I think that is a reasonable base on which to proceed as well, because the expense which was incurred in that year was charged against the size of the plant as it existed at that time. Obviously, if the plant had been but half the size, we could not have justified that amount of work. In my opinion, that method gives a fair result.

2207 *Cross-Examination by Mr. Haight.*

"Mr. Haight: If your Honor please, there are some subjects on which we might interrogate Dr. Jewett but which have been fully covered on depositions already taken, so that I will not attempt to cover some of these and hope to avoid such."

I spoke of certain tools that had been developed in the Department of Development and Research of the American

Telephone and Telegraph Company and in the Bell Laboratories and that had been beneficial to the industry. In my opinion, the investment for those developments has been justified economically and, in my opinion, the results of that work have been rather large and favorably large economically. A great many of them have been beneficial to the associate companies and to the local exchange plants.

2208 It is my opinion that they had been or would be more largely beneficial to such plants than to the Long Lines.

Referring now to the tools and their effect, and not to the specific use of the devices as devices, in my judgment I should say that there is no question that, in the total value, the effect of those tools has been much more largely valuable to the associate companies than to the Long Lines. By that I mean their value as a whole to the whole group of associate companies on the one hand, and the Long Lines on the other hand.

I am speaking economically.

2209 In respect to the things themselves, and not as tools, I should say that the value of the use of the things themselves, or many of them, has been greater to the Long Lines than to the associate companies. I say that, carrying in mind, of course, the fact that many of the things which have found a use only in the plant of the Long Lines have not only not been of benefit to the Long Lines, but have been quite the reverse, and have involved expenses incurred for the benefit of the associate companies, particularly radio. I think if I could appraise the total value to the associate companies as a whole on the one hand, and to the Long Lines on the other hand, the value would be much greater for the associate
2210 companies as a whole than for the Long Lines; but as related to the plant in dollars per plant, it probably would be in favor of the Long Lines. For some of the units, it would be very much in favor of the Long Lines.

The results of the development of what I have denominated as the tools have been the making of things cheaper, the making of installations cheaper, the operating costs less, and the service better. The effect has been a continuing one over the

last 10 or 15 years, year by year, but not uniformly continuing. In each of those years, there has been that beneficial effect in those four regards, although the pace has been different in different years.

The same thing is true in regard to these developments in respect to the tools, in so far as the Long Lines are con-
2211 cerned, but the pace of increase has not been so great in the case of the Long Lines as it has in the case of the associate companies.

In respect to the things as distinguished from tools, those developments have resulted, as far as the associate companies are concerned, in the making of the things cheaper, in the installing of them more cheaply, in the operation of them more cheaply, and in the giving of a better and a more
2212 extended service. The same thing is true, and in the same regard, in respect to the development of things relating to the Long Lines.

If it should appear that through the use of these things, large profits had been gained by the Long Lines, I would not necessarily expect even larger profits from the associate companies through the use of these developed and improved things, since the effect is greater upon the associate companies. This is because the business of the Long Lines is a very much simpler business than that of the associate companies. The business of the associate companies involves very large quantities of types of service with which the Long Lines have nothing to do, and I am not in a position to make an appraisal of the effect of these particular things which have come out of the work, in relation to the relative profits of these two groups, in the face of the very complicated situation which is involved by the fact that you are not comparing two things which are alike in kind. That is the differ-
2213 ence which immediately occurs to one: that the Long Lines Department is dealing essentially with a transmission problem in the handling of toll service; it is not dealing with a switching problem and it is not dealing with a local exchange service.

I mean that the Long Lines has to do only with the trans-

mission problem and does not have to do with the telephone instruments or their connections, or switchboards in the local exchanges, or connections to a toll board. I also mean that I am trying to keep my mind to the things which have resulted from the work in the period in question, and in both of those two groups (the Long Lines on one hand and the associate companies on the other hand) there are tremendous factors which inhere in the work which was done in the period preceding the first year here, and that work has a vast influence on the relative and absolute results, not only on the
2214 absolute, but also on the relative commercial results of the two organizations; and I am not competent to appraise the whole thing.

"Q. Because of these developments and improvements in things made over the years, when we speak of a transmitter, for instance, today, save in its most general aspect, we mean a different thing from what we meant when we spoke of a transmitter of fifteen years ago, do we not?

"A. No, not for a large number of transmitters that are in operation today."

If we go back to the days when we had a separate transmitter for long distance and a separate transmitter for the local exchange, then we would mean a different thing than we do today. That same general idea is sound in respect to many of the things that are used in this art, if you go back far enough.

2215 If I were to build a plant today, it would look like a plant in 1914; they would have many things in common, and I presume to a casual non-engineering observer they might look quite similar in some respects.

In many of the details, the plant of 1914 was different
2216 from the plant of 1932. In their essential elements and in their fundamentals of switching and transmission, the same fundamental elements would appear; they have been in the telephone art since its beginning.

"Q. And the things which you would put in today, speaking of them generally, would be better things in so far as their results and service are concerned, they would be cheaper

things to make, they would be cheaper things to install, and they would be cheaper things to operate, would they not?

"Mr. Blackman: Cheaper than what, Mr. Haight?

"Mr. Haight: Q. (Continuing) Than what went before, at any time you wish to choose.

"A. On that basis, in answering your question, one has to make an assumption as to price and wage levels as they might affect it. I take it that you are referring to the inherent costs on the same basis of the fundamentals of prices and wages.

"Q. My postulate is your testimony.

"A. Yes.

"Q. (Continuing) That because of this contribution of the Department of Development and Research and the Bell Laboratories, and the similar work done before its cre-
2217 ation, they have brought to this industry, both in the Long Lines service and in the work of the associate companies, things that are better, that give better service, that are cheaper to make, that are cheaper to install, and that are cheaper to operate, and that that benefit most largely is to be reflected in the associate companies. That is my postulate throughout all of this examination.

"A. Yes; I see. Well, on that basis I would say that as the result of the work of the Department of Development and Research, that is true. As I understand the question, it referred to all parts of the telephone plant, many of which have not been touched by the work of the Department of Development and Research."

The Department of Development and Research has had to do with transmitters, telephone instruments, wires,
2218 cable, conduit, switchboards and poles. It has not in any large measure had to do with the tools with which many of these things are installed. It has not had to do, and certainly not in recent years, with the types of buildings in which we put those things. It has had to do essentially with the electrical parts of the plant. Not in recent years has the Department of Development and Research had anything to

do with the devices for setting poles. When I speak of
2219 tools, I mean types of tools, such as trench digging machines, and all of that type of equipment.

As I envision the future as to the use of the things that have not yet been made commercial, and as to the adaptation of the things we now have to new or better uses, the effect is going to be greatest on the associate companies and more than upon the Long Lines. I mean that, as I look into the future, on many of those things which we are working on at the present time the results are going to be still cheaper things to make, still cheaper to install, still cheaper to operate, and a still better service, and those things are going to appear more largely in the plants of the associate companies.

However, anyone looking ahead in 1923 would have
2220 had no right to expect the same thing for the immediate period ahead, because at that time much of this work which has been covered in my testimony of the last two or three days related primarily to the things which were of a transmission character, and which would certainly find their application and have found their first and largest application in the plant of the Long Lines.

2221 In my testimony, when I referred to the Bell Laboratories, I referred to that part of the Bell Laboratories whose expenses were billed to the Department of Development and Research. When I refer to the Bell Laboratories, I mean the Bell Laboratories and its predecessors.

I think, as I explained in the last part of my direct testimony, that in an attempt to allocate the expense for a specific and limited period of years to the beneficiaries, par-
2222 ticularly when that limited period of years ends in the current time, the application of the expense for the particular year in which the expense is incurred is not only fair, but is the only way in which that allocation can be made.

I do not know whether it is the common method to carry the costs in the development of a particular thing until the work is completed and then allocate the expense to the particular thing on which the work was done when it goes into use. I have tried to indicate that on a very large part of this work

of ours the value was not in the thing itself, and it would be unfair to assign it wholly to the thing; that the value resided in the collateral effect of the thing. I believe that research and development work should somewhere, somehow,
2223 some time, pay for itself, because if it doesn't, it cannot exist. This work about which I am talking must at some time be translated into things, or the values which inhere in things. Sometime, certainly, as to that work that does finally come into use, it goes into things, but they may not be values in the thing elements on which the expense was incurred.

I don't know exactly how long we were working on the semi-mechanical and machine switching equipment. It was a long period of time; a very great many years. The work upon the loading coils for open wire toll lines went over quite
2224 a good many years; it was probably 15 or 16 years. The work on the machine switching equipment is still going on in a very large measure, and I presume it has been going on for 20 years. The reason that I could estimate the length of time of the work on open wire loading coils is that that work came to a conclusion.

There was a physical embodiment as a result of the machine switching work in Chicago in 1923. I don't know when large, active work on machine switching began, because it began before I was associated with that kind of work, but I should assume that it had gone on for 15 years before that, possibly.

The work on loading coils for toll cables is still going
2225 on and has been going on ever since we began to work on loading, that is a period of 30 years, and it is going on in increasing measure at the present time. The same is true of loading coils for exchange cables.

We began the work on vacuum tubes in 1912 or 1913, and that is still going on, and, as far as I can see, will continue to go on. The work on vacuum tubes went on for about two years before we actually used a vacuum tube in repeater work, and the work went on about a year before we had trial installations. There was work on repeaters before our work on vacuum tubes was commenced. Those repeaters were the

so-called mechanical repeaters, but for the most part they had to do with the attempts to make a telephone transmitter speak to a telephone receiver supplied by a local source of energy. Those attempts, as I understand it, had been made from the very early days of the telephone business.

2226 I have not a clear picture of when we began serious work on the 24 and 26 gauge cable, but it was a considerable number of years ago. The whole history of the lead covered cable art has been a continued attempt to reduce the size and so to increase the number of conductors in the lead sheath; and this fine wire cable development, which is the most recent stage of it, is the work which was done in the most recent years, and was largely made possible by the tools which had been made available to us in other fields of our development and research work. I have not looked up when we started to use cables containing wires that were finer than the 22 gauge, and it is a guess on my part, but I should say that the first beginning was approximately 10 years ago.

2227 The work on transmitters has been going on ever since the work began. I can only very roughly group the results into any period based upon the character of the transmitter, because I am not personally cognizant, nor have I made an attempt to familiarize myself with the very early days and the various kinds of transmitters. Coming to the time which is within my own knowledge, there was, of course, a period of 15 years or more in which the transmitter art, so far as large advances were concerned, practically stood still, when we had the type of transmitter which was commonly used in the desk stands and wall sets, and that period began to merge into the present period some years after we had begun our work in the general classifications that I referred to as 5, 6 and 7. In the earlier period, the changes in transmitter structure were, from an engineering standpoint, of a detailed character, rather than a fundamental character. Since that time, the changes have been of a more fundamental character.

2228 This new art, which has been so potent in influencing the whole trend of our research and development work,

started subsequent to 1913 in any large form, because it was at that time that we got the first tools to make it available, and, as I have indicated, the first urge when we got those new tools was to use the tools themselves as things in the telephone plant, and the art of using them as tools for the development of other things may have been delayed a year or so and then commenced to operate.

The work on receivers has been going on ever since the business began.

Work on the hand telephones was started before I came into the business, nearly 30 years ago. The first attempt to use them was made quite a good many years ago, and was disastrous because of the fact that we did not then know how to combine these high efficiency transmitter and receiver units in a solid handle, and we could not degrade them in efficiency so as to combine them. As I have testified, it was only after we had developed the art both as regards the transmitter itself and as to the assemblage that we got our present
2229 instrument. My recollection is that they began to go into service possibly six or seven years ago in a small amount. They worked all right in local work over in France and other European countries. I say "all right," but they weren't all right from the standards of American telephony.

The whole basis upon which the Bell System has been built up (and, so far as I know, it is a basis which has carried over into all American telephony) was that the transmitter and the receiver (which are the dynamo and the motor, if you will, of the electrical communication system) should be each of the highest possible efficiency, and uniformly at that high efficiency. The whole urge has been always, over the entire history of telephony in this country, to increase the efficiency of the transmitter and the receiver. As those efficiencies were increased, so that you had more energy given out and less energy required at the receiver, they have resulted in an extension of telephony, because it has been possible by
2230 those means to go farther with a given size of connecting wire plant, or to cheapen the wire plant by making it smaller for a given distance. One of the most sacred and

rigidly enforced rules in the Bell System has had to do with the standards of the transmitter and the receiver as they are operated in the associate company plants.

Now, the result of that long course of rigid adherence to a principle was to build up a vast local intercity and interstate communication plant which required the high standards of transmission and reception of the transmitter and receiver, and all plant was engineered on the basis that those high standards were in the plant. Any attempt on a large scale, for whatever purpose, convenience or otherwise, to degrade the transmitting efficiency of the transmitter or the receiving efficiency of the receiver, would immediately have degraded not only the service of the person who had those instruments, but everyone with whom he was connected, and there was an impossible barrier to that degradation. The development of these high efficiency transmitters and receivers, used as they were in this plant, in desk stands and in wall sets, was not involved with this characteristic with which they are involved when you associate them together in a handset and rig-

2231 idly connect them. You can get the effect in a wall set or a desk stand, particularly if you are on a short loop, by the simple operation of putting the receiver in front of the transmitter, touching the two things together, and they will start to howl. You can get it by taking a wall set or a desk stand transmitter and receiver and rigidly connecting them together, and starting them, and they will continue to howl. But we had found that, to bring in the convenience of the handset, we had to solve the problem of associating these very highly efficient transmitters and receivers together in a rigid handle, and having them of such a character that this instrument, which can be used in many positions in which the desk stands and, certainly, wall sets are not usually used, would have very little positional effect. This would not only be used in many positions, but could be used in all services, whether local, long distance or Long Lines.

2232 The reason why this handset was not used in the American system was not because it would not work in giving service; that was not the reason. It would not work

in either local or long distance service; it would degrade local service as well as any other kind. It would degrade all service.

That service had been engineered to a point when the phone on one's desk must be one that could be used either in local service or a call to New York City.

The same instrument is used for all service; take this plant here in Chicago: if the plant of the Illinois Bell Telephone Company for some reason or other were divorced from any necessity of connecting outside of Cook County, it would not make one iota of difference so far as the subscriber's loop and trunk plant is concerned, except possibly in the number of circuits that are required in the engineering of that
2233 plant today. The same transmitters, the same receivers, the same transmission requirements for sub-station apparatus would apply.

"Q. You know, don't you, Dr. Jewett, that right here in Chicago we had one kind of transmitter, then long distance came, then we put in long distance transmitters because the others would not work in long distance; you know that history in respect to Chicago itself, don't you?

"A. That ancient history was true of all cities, certainly."

When the long distance transmitter began to be used in local service, we had a better transmitter for local service also. When I said that the bringing of the French telephone into our system would degrade the service, I meant not only
2234 that it would not work at all in long distance service, but that it wouldn't work at all in local service. It worked in local service in Europe, but it would not have worked in the local exchange plant here without degrading the service to the point where it would have been unsatisfactory.

The local plant had been engineered on the basis of getting the best service at the lowest possible cost, and when you refer back to the time when the long distance transmitter, as you call it, was made standard for local service, the net result of that on the local plant was either to cheapen the local plant in its transmission characteristics, or to extend the range of

the local plant transmission with the same unit grade of transmission service. At the present time the local plant, so far as its transmission characteristics are concerned, is engineered substantially without relation to its use in long distance service, and the service which is sufficiently good for the local exchange area from what transmitters and receivers you use will give you long distance service over any distance that you want to go.

2235 I don't know whether someone in connection with the American Telephone and Telegraph Company gave a picture of our telephone system by saying that we might look at it all just as one exchange. I never heard that, or, if I did, I have forgotten it. I have heard of Mr. Vail, and have read some of the annual reports put out by the Company when he was President. It has not been the theory of the American Telephone and Telegraph Company for years that the Bell System is regarded as one big exchange and engineered on that basis. With all due respect to Mr. Vail, if he said that, I don't think I would make that statement.

There was a time when it was proposed to give long distance service by the process of so increasing the power of the transmitter and receiver used in that service that you could

2236 give the long distance service. But, as a result of our work, we came to the conclusion that if long distance service as a universal thing in this country was to be largely and economically used, the interconnecting plant between local exchange areas must be of a character which would permit of the service being given through local exchange plants which were engineered for the local exchange area, and that has been done. As a result of that, we have standardization in all local areas in the sense that at any given time, so far as fundamental instrumentalities are concerned, things that are installed in a given kind of plant in one part of the country are the same as in any other part of the country. That does not mean that we are in a static art; those standards may change, and they change from time to time whenever we have made an improvement which makes possible a step forward for all. They are standards in the sense that I have indicated,

and not standards like the yardstick or the pound, which are invariable.

2237 Certain standards are commonly applied. The transmitter and the receiver, which are the heart of the thing, are the same everywhere, so far as it is humanly possible to make them. Now, that does not mean that we can be sure that the 17,000,000, or whatever number there are, of transmitters that are out are all identically the same. There are obvious variations, through use and age. Nor does it mean that, when we introduce an improvement in the transmitter, we will say, which enables us to make a transmitter with a somewhat higher efficiency, and we are sufficiently sure of it to start to manufacture it on a large scale, we go out and junk all of the old transmitters. It means that on all new plant and on all replacements that new transmitter goes in, and that in time the average level of transmission efficiency from all sub-stations has been raised, and ultimately all of it, or substantially all of it, brought up to this upper level. The effect of that improved transmission is taken account of by the engineers in engineering their entire wiring connecting plant.

2238 They must have standards of transmitting and receiving efficiency if they are to do any engineering work in their wire plant.

In Europe (France in particular), where there were no standards, there was no engineering of the plant, and there could be no engineering, because there was no standard on which to base it. The result was that some subscribers, over whatever wires were put in, got reasonably good service when they would talk to certain other subscribers, and certain others could not talk at all. But what we have aimed at, and what, largely, we have succeeded in doing by engineering which makes the local exchange plant independent of the toll plant, has been to provide a reasonably uniform grade of transmission service for both local and toll purposes with the same instrumentalities.

These same instrumentalities are used in the long distance service, but, as I said, if the long distance service should disappear today, it would not change one iota the engineering of

the local exchange plant in the City of Chicago, so long as it maintained its present standards of local transmission, except in so far as elimination of long distance service eliminated plant.

2239 – The Department of Development and Research is the final judge as to whether things produced meet the specified requirements for new and improved service. In general, but not necessarily, after that judgment has been made, that particular thing is made standard. The exception to that would be that a thing which had been developed by the Department of Development and Research, and found to be satisfactory for the service, was found by the Department of Operation and Engineering not to be desired at the time that it was ready for use, and it might, under that kind of a condition, not be standardized at that time.

In general, the associate companies are advised that a new device has been made standard through letters or bulletins issued by the American Telephone and Telegraph Company, through its Department of Operation and Engineering, and, if it involves apparatus, usually coincidentally by advice
2240 from the Western Electric Company indicating the way in which the apparatus should be ordered.

The Bell Telephone Laboratories, of course, is a company which has a capital of $100,000, and there are no dividends paid on that capital. The remainder of the money, which is represented by the plant in operation and the necessities of the Laboratories, is obtained from the owners of the Laboratories by borrowings, on which interest is paid. That interest is a part of the charge which makes up what we call cost. There are two regular rates of interest. For the majority of the money involved it is one rate. Then there are certain recurring borrowings during the year, mostly for short periods of time and varying somewhat in amount, which
2241 are at a slightly lower rate. The rate of interest on the main amount is 7 per cent and on this temporary recurring borrowing, it is 6 per cent.

"Q. I understood that the Department of Development and Research in doing what at one place you called intellectual

work, would turn over its study for further study and development by the Bell Telephone Laboratories, and an estimate would be made of the amount to be spent thereon, or some basis of cost. In a general sense, each one of those projects would be budgeted. Did I get the wrong idea?

"A. You are referring now to the part of the development and research expense which is represented by the
2242 amount that they pay to the Laboratories?

"Q. Yes."

Possibly a specific explanation of how that is handled would give you what you have in mind. Before the beginning of each calendar year, both the Laboratories and the Department of Development and Research make up budgets, which budgets are approved. Now, those budgets constitute substantially nothing more than the authorization to the two departments to proceed with the year's activities on a certain scale of operation. That is, they are the advice which I, as Vice President, finally get from the President and the Board of Directors, that the D and R can proceed on such and such a basis, organize for that, and the advice which I get as President of the Laboratories that the customers of the Laboratories have authorized us to proceed on a certain general basis.

Now, in making up those budgets, which determine the size of our force in large measure, and the size of the force determines everything else, the general scope of the work likely to be done during the year, either for D and R or the Western Electric Company is outlined, and we have a general broad understanding that in this particular field we are likely
2243 to be called upon to do so much work in laboratories for D and R. Some of it we know more specifically about, because it happens to be current at the time the budget is made up. If, during the course of the year, a project arises in D and R which requires the assistance of the Laboratories, it falls in one of these classifications that have been previously generally considered, and the requirements of that work and the amount, as to character and general amount, are transmitted to the Laboratories. They, in turn, study that particular

request and make an estimate both of time and money that it will cost to carry out, and they certify that to the American Company, the Department of Development and Research, in a work sheet which outlines the work, the basis for that work, and the estimated amount that they think it is going to cost to do this thing. That work sheet goes to the Assistant Vice President, and from him to his associates for a check against their original request on the Laboratories. If they agree that it is all right, or if, after consultation with the Laboratories, they modify it and then agree, that work sheet comes back to me, as the Vice President of the American Telephone and Telegraph Company, and if I approve of that work being carried on in the Laboratories at the expense of the Ameri-
2244 can Company, I sign that authorization on behalf of the American Company and return it to the Laboratories, and a copy goes into our D and R records. It then becomes the authorization for the Laboratories to do the work and to bill the expense of the work to the American Company and the authorization to the American Company, or its proper officers, to pay those bills if, as and when rendered, when they have been certified to by the D and R people as being correct. And, in the process of certifying to me that the work requested to be done is not only proper, but as to kind and amount, the examination which is made by our people runs back to the general consideration of work in that whole classification as it was at the time that the budget was made up, so that I am not put in the position of authorizing work in excess of what we originally had in mind at the time that the budget was made up. Now, many times I do authorize work in a given classification in excess of that which appeared in the original budgetary study, because that general budget, which is approved at the beginning of the year, was not a rigid approval of the division of expense among all of these
2245 numerous classifications. There are a great many of these work sheets, on the average, during the year. If I were to give the number, it would be the roughest kind of a guess. I would not say that they run into the thousands. The work sheets might run up between one and two hundred.

There are a large number of projects that go on. Of course, the way the accounts are kept the number of specific pieces of paper referring to the work are very much greater in the Laboratories than they are in the Department of Development and Research, because of the thing that I testified to a day or two ago; that is, in recent years we have charged the D and R work to classes of work rather than to specific jobs.

Taking both the Department of Development and Research of the American Telephone and Telegraph Company and
2246 the Bell Laboratories, if you were to go down there to examine the sheets for one year's work you would find in the Laboratories a very large amount of material, because of the way in which the things are kept up there. How much, I cannot tell, because personally, even though I am President of the Laboratories, I practically never see the things referring to Western Electric Company work which correspond to these things that I have been describing to you for the American Telephone and Telegraph Company. That is carried on directly by the Vice President of the Laboratories with the Vice President of the Western Electric Company. I would think you would be confronted with thousands of sheets containing these various matters.

These studies cover many things, the matters of opera-
2247 tion of existing apparatus, and also the improvements of existing apparatus. They also cover new apparatus. I do not think these records are classified on any such basis as that. In the D and R this work is classified in accordance with the classification shown in Exhibit A-114.

The American Telephone and Telegraph Company and the Western Electric Company are billed for the work
2248 authorized to be done by them. In general, the majority of the work billed to the American Company has to do with the fundamentals of things which may underlie apparatus and do underlie operational studies, but even in the billing to the American Company there are certain things where these fundamentals involve the fundamentals of apparatus. Now, conversely, in the case of the billing to the Western, while most of it does relate to the preliminaries of

manufacture of physical things, there are billings from the Laboratories to the Western which are somewhat analogous to the principal billing to the American Company. You cannot sharply segregate and say that the billings on apparatus go one way and the billings on the other things go the other way. The same is true with regard to the smaller billings from the Laboratories to its other customer, the Electrical Research Products.

2249 Most of the research laboratories that I know of are connected with manufacturing companies, and their problems are the problems involved almost exclusively in the development of things to be sold, but, as I explained at the time my deposition was taken, the research function of the Bell System is a very different thing from that in its larger aspects. The thing which we sell ultimately is not apparatus, but it is service.

In distinguishing between the preliminary development work and the work upon specific things, in so far as the Laboratories do any of the former, it is all one enterprise and in one laboratory, and usually handled that way in connection with other manufacturing concerns. It would be quite possible to have the Department of Development and Research of the American Company and the Laboratories housed in a single housing. As a matter of fact, they do operate essentially as a unit in so far as it relates to the business of the American Company, and I am chief executive officer of

2250 the whole operation. One of the reasons for the segregation as we have it at the present time is the fact that a very large part of that division of the work which is done by the Department of Development and Research brings them in such intimate contact with the Department of Operation and Engineering that it would be a considerable inconvenience and handicap to have them separated physically. It is the same kind of a situation which developed many years ago in the laboratories of the Western Electric Company, which might better have been, from a purely Western Electric standpoint, associated with the factory, but which were separated from the factory at Hawthorne and taken to New York.

because so much of their work had direct contact with the American Telephone and Telegraph Company.

In relating the expense of the Department of Development and Research over a period of years to the plant investment in the Bell System, procuring a result of $1.89 per year per thousand of investment, the plant figures which I used
2251 were given to me by Mr. Crunden. I think I got them from Exhibit A-111. What I got was the average plant during the period in question, which I related to the average expense for the same period.

2252 (Defendants moved to strike the answer in regard to the $1.89 cost, inasmuch as it was based upon Exhibit A-111, for which a motion to strike was pending. Court ruled that the motion to strike this answer should be argued together with the motion to strike Exhibit A-111:)

"Q. You gave five classifications of the work of development and research. One of them was the work of supplying information to properly install new plant. Does that cover the specifications for installation of plant items by Western Electric?

"A. No, that is not what I had in mind."

What I had in mind was the information which was given by D and R to the associate companies, either directly, or, more generally, indirectly through the Department of Operation, to enable them either to install plant or to see that it is properly installed. It did not refer to information to the Western Electric Company in regard to the installation of central office plant. It did not necessarily have to do with
directions in relation to items produced by the Western
2253 Electric Company. It may have to do with such items, but I would not say that it almost always has to do with such items with some exceptions. For example, in connection with all inductive interference matters which involve the installation of the wire plant of the associate company in its relation to the interfering plant, it has little or nothing to do with the Western Electric Company. It may have little or nothing to do with the current relation with the Western Electric. It may have to do merely with the rearrangement of

existing plant. What I had in mind, I should think, generally did not have to do with apparatus manufactured and sold by the Western Electric Company. It does have generally to do with the installation of the items in the plant account of the company, because all of our work primarily deals with physical things. But, to give another illustration which is closer to the Western Electric: in the early years of the telephone
2254 repeaters and in the improvement in telephone repeaters as they have come along, and with the introduction of carrier, the thing to be installed was a piece of apparatus made by the Western Electric Company. The information which we furnished to the associate company was not concerned with the installation of that thing by the Western Electric Company, or possibly not even by the telephone company as a specific thing, but it had to do with its relation to the balancing of the plant and the kind of plant on which it could be used, the kind of information which the telephone company itself must acquire from us or somebody else in order to utilize this physical thing which may have been made by the Western Electric Company.

If the telephone company had not had this information from us of the kind I refer to, it would have required more than engineering in the building of a new plant. It would have required the acquisition of new engineering knowledge. It is that new engineering knowledge which I had in mind as being furnished by us to the associate companies. After they have got it with regard to any particular thing, if the art
2255 does not change, it is not a continuing thing that we do; it is the thing that we do at the time that the thing becomes a new factor in the plant; it is to give the engineering departments of the associate companies that new information which they must have to operate.

It would be necessary for the engineers constructing a new plant to have that information and it would go in as a part of the engineering cost of constructing the new plant if they acquired it. When the associate companies get that information, however, they do not pay a specific charge for it. We never bill anybody for that kind of work. I do not mean that

it is done for nothing, but what I mean is that that kind of information is not billed to the recipients of the information as a specific billing; it is one of the services under the license contract.

In respect to these five general classifications of the work of development and research, I am not able to tell the
2256 amount spent in respect to each, because those are not classifications in connection with the Company's business, but are merely classifications of the way in which I presented the illustrations.

I have forgotten exactly what I had in those several classifications, but I think it is safe to say that there is no sharp line of demarcation between them, although, as I remember giving them, they did relate to rather distinct kinds of things given by way of illustration. The specific items of expense in Exhibit A-114 that I have included in Exhibit A-115, under the column "Transfers to Other Departments including
2257 Patent", I think are all as indicated by the notation at the bottom of the sheet. Take the year 1930 as an example; they are all marked by asterisks. On the 1930 sheet is an asterisk under "Engineering Services, Ship-to-Shore Radio", followed by the legend, being the last entry upon the sheet, "Expense Chargeable to Other Departments of the A. T. & T. Company". Then the reference goes up to the nineteenth item, "Engineering Services", and under that indicates "Ship-to-Shore Radio".

2260 There is not included in Exhibit A-115 any intra-departmental charges. There is no intra-departmental billing in the D and R. There is no inter-departmental billing for the normal functions of the department.

The deductions shown on Exhibit A-115 were made only for the purposes of allocation. Those deductions in those two columns were made to give a net balance of expense
2261 incurred directly or by billing from the Laboratories which appears to me to be the proper amount to attempt an allocation of. I had the figures on Exhibit A-115 compiled and went over them shortly before coming out here on

this trip. While I have been here, I have rechecked the validity of the items in the classification "Non License Expenses" against the original records, to make sure that I agreed that these deductions which had been found for me were proper things to deduct as non license expenses. We have been working on the figures on Exhibit A 115 for a considerable time. This particular printing of that exhibit that I have before me certainly was within the last few weeks. These figures were never given to Mr. Heiss of the American Telephone and Telegraph Company by me. As far as I know,

2262 they were not given to him by anybody.

"Q. I understood you to say that the telephone industry is not subject to the economic principle of reduced costs due to mass use, and that the Department of Development and Research expenses are to produce lower unit costs to offset increasing costs, due to increase in number of subscribers, is that correct?

"A. No, I think that is an expansion of what I said."

It involves what I said, but I think I said that the telephone company did not have the element of mass production entering into it in the same way or to the same extent as it is commonly assumed to enter into mass production as a means of bringing about an inherent unit reduction in the cost of the things produced when you increase the number of them. I went on to indicate that there were some factors in connection with the telephone business which inherently operated in a directly opposite fashion, but I do not think that I ever said that no element of mass production appeared in the telephone business, because that is certainly not true with regard to the manufacture of apparatus. Mass production in a factory, whether it makes telephone apparatus or whether it makes

2263 any other apparatus, has that factor in it. What I said, and what I attempted to illustrate was that in the plant required for serving increased numbers of subscribers, there were certain factors which brought about, under certain conditions, the inherent requirement of a greater and more expensive plant per subscriber than under other conditions, and I illustrated it by the inter-office trunk plant and central office

equipment of exchange areas as they grew from the capacity of a single office to the requirements of two or more offices.

I think, considering the toll broadly to include both local and longer distance toll, that that same factor appears under certain conditions in the toll plant, but not to anywhere nearly the same extent that it does in the local plant, because the problem of toll is either primarily or more largely a transmission problem and not a switching problem. That particular factor comes in because of the switching element, which is so predominantly local exchange. What I just said about toll would apply to the Long Lines plant of the American Telephone and Telegraph Company. Where the factor
2264 applies, that particular factor is concerned with switching, and, to the extent that the Long Lines service is involved in switching, it there appears also. I have not the slightest idea what proportion of the Long Lines plant is involved in switching. I should say it was a very considerable portion.

The work of development and research, in my opinion, had an effect to increase the number of users of long distance service. It led to an increase of the fields of use of the Long Lines. I mean by the fields of use, new services. One of the fields is one to which I referred this morning, the switched typewriter service, which our work has opened up, both
2265 to the Long Lines and to the associate companies. Some of the others are: the field of picture transmission, which our work has opened up to both the Long Lines and the associate companies, but which so far, with one exception, has been made use of only by the Long Lines, to its very considerable financial cost. In the radio field, of course, it has opened up the possibility of giving telephone service to Europe by radio plant furnished by the Long Lines, but that is not a new field of use, that is an extension of telephone service. There is one thing which, while you might call it telephone service, of course, is not telephone service in the ordinary sense. It is the provision of the program transmitting circuits which are used in conjunction with radio broadcasting. There is a field which has been opened up to both the

Long Lines and the associate companies and is availed of by both. I do not think of any other fields at the moment.

2266 There have been tremendous extensions, both in the Long Lines and in the associate companies, in the use of leased telegraph wires, but that was a service which is old in the telephone art, it really is not new. That is a considerable field; it has been. I do not know just what it is at the present moment.

When I was asked the following questions and made the following answers:

"Q. Now, take the class of work which you have referred to as protection of your system from interference by electrical currents or trolley wires or high-powered electrical transmission lines.

"A. A very large part of that has no connection whatever with the manufacture of apparatus. Some of it has connection, particularly where it relates to protection from things like lightning, but where it relates—and this is a very large part of it—where it relates to the work which we do in connection with the inductive interference, or electrolysis,

2267 it has no substantial connection, practically no connection at all with the manufacture of apparatus.

"Q. Is a large part of your expense under that classification directed to that kind of work?

"A. Yes, I should say 95 per cent of it."

I think what I had in mind was that the 95 per cent applied to the whole classification, and I think the answer is correct, because (while that title has interference prevention and protection and I have made a reference to the things concerned with lightning as a qualification to indicate that in that it had to do with apparatus) very little expense is incurred by the Department of Development and Research in that field where apparatus is involved. The expense in that field, the development field, resides primarily in the Laboratories, in the construction, development of apparatus, and that expense is not billed to D and R, but is billed to Western; it follows the

2268 apparatus. I think I had in mind qualifying the original statement that it did not relate very much to apparatus, simply to indicate that there was in the designation a

thing which did involve apparatus. The 95 per cent, I still feel, holds against the whole classification, so far as expense and application in the Development and Research Department is concerned, because the amount which relates to the apparatus item under lightning protection is so very insignificant.

In Exhibit A-116 (that is the one "Maximum Amount of D and R Expenses Allocable to Non-Bell Sales of Western Electric Company (Excluding Special Commercial Products)"), I classify all the development and research
2269 expenses into apparatus and lead covered cable. The same qualification which I made with regard to the allocation of expense against associate company and Long Lines beneficiaries runs in these classifications, that is, work of our department done in the year 1923 does not, in general, appear in the business of the Western Electric Company in that year. It may appear at some later date. But, in order to make this allocation, I had to assume that it did apply in that year and I made the further assumption, as I testified to, that all of our work which we did ran to apparatus, and I testified that I thought that was a very liberal estimate, because so much of it has no concern, so that I felt that I was making a maximum allowance of the expenses of our work in connection with the Western Electric telephone apparatus and lead covered cable. In a word, what I assumed was that, as a result of our work in the telephone apparatus and lead covered cable field, the Western Electric Company developed a large number of baskets of things, all alike to each basket, and that they sold some of those things out of each basket to the Bell associate companies, and a very much smaller amount of things, but still some out of each basket, to
2270 non-Bell customers, and that if you were going to make a deduction from the benefit of our work on account of this non-Bell sales of these identical things, it was fair to assume that a proportionate part of that deduction was represented by the relation of the non-Bell to the Bell associate sales.

Save for this question of time which I have explained, this exhibit assumes that all of the development and research

expense that I have allocated here to particular years has led to the manufacture and sale of things by the Western Electric, which is an over-liberal assumption. I apportion each of the expenses of development and research between the non-Bell customers on the one hand and the Bell customers of the Western Electric on the other hand entirely on the basis of sales. I do not think that I could testify as to whether I was the originator of that idea or not. In order to answer
2271 the question before the Court of attempting to make the allocation of expense, it first appeared to me to be an impossible one in much of our work, because of the fact that it was, in its very nature, of a kind which can only be applicable many years in advance, and at first I felt, except with a broad general yardstick, it could not, class by class or year by year, be done. I and my associates had numerous considerations of how we could do these kinds of things and out of it grew, so far as this particular item is concerned, this, which seems to me an entirely reasonable way of doing it, a very large over-emphasis of amount of deduction which should be taken on account of these non-Bell sales. I will take the
2272 full responsibility for the use of this in support of my judgment. I think if I had simply been told that I had to make an allocation with this kind of a credit given, I am quite sure I would have come to identically this kind of an answer. I think that that sales basis is a liberally fair one under the circumstances. None of my associates disagreed with me in thinking it was liberally fair.

When it came to distributing it among the various entities in the Bell System, I abandoned the sales method and put it on the basis of what they already had, because I was dividing the different kinds of things; I had a different denominator. I was allocating costs in both cases.

"Q. And in the first case, between the non-Bell and the Bell customers of the Western Electric, you took it on the sales basis, and you considered that a fair basis, apply-
2273 ing it to the goods that were sold? That is right, isn't it?

"A. I did,—the Western Electric Company did not,—because there was not a tremendous accumulated investment in

the things as of that time. The only things that we had at that time were the things that were in transit.

"Q. But when you came to dividing them among the various Bell entities, you used this kind of a philosophy; that if Mr. Bracelen has a 10,000 acre farm, and I have one of ten acres, and we hire you to develop a rat-trap to put in each of our granaries, you will charge him in proportion to the value of his ten thousand acre farm, and me in proportion to the value of my ten acres, that is your philosophy, isn't it?

"A. Well, otherwise I would assume you had more rats per acre on your farm.

"Q. Then that is the sales philosophy again, isn't it, your rats per acre?"

I have stated very positively, and it is my firm belief, that any allocation for any purpose of the cost of this work of ours has to be related to physical things, as the fairest way of doing it, because it involves physical things. Now, in the one case I was trying to make an allocation for the sake of making deduction which was not going to be applied to anything concerning the Western Electric Company, but it was going
2274 to be applied to a deduction from our expenses, because a benefit had arisen to somebody who was not one of those whom I was ultimately going to divide it among. I still have to stick to my physical things. How was I going to, year by year, get that amount to be deducted without relating it to the physical things which I found at that time? I had not the slightest means of knowing what the total amount of all this stuff was that the Western Electric Company had sold to everybody over that period. The only physical things I had were the things which were in transit and through the Western Electric Company at that time, and it seems to me that of the factors I had available, the fairest ones which related to physical things were measured by the sales of those physical things.

I did not follow the principle that cost of development and research should follow the goods when I came to make this allocation of expenses among the units of the Bell Sys-
2275 tem, because, as I have already tried to explain, any

attempt to make an allocation among the associate companies and the Long Lines year by year, for a definite period of years which terminates at the immediate present, when none of our work of the last year has appeared in the plants, or substantially none of it has appeared in the plants, and when at the beginning of the period I obviously cannot take ratios of something in the years preceding because the things do not apply, I am limited, if I am going to have an allocation year by year, to the ten or eight or ten things which I found in that interval.

"Q. Did you try this consistency of applying that same doctrine in allocating between Bell and non-Bell, relating to Western Electric sales?

"A. Well, how can I? I don't know all of the things in the non-Bell field. All I know is what the Western Electric Company has sold in the non-Bell field."

"Q. But each one of these had an investment, each one of the non-Bell customers, each telephone company, had an investment primarily ascertainable?

"A. But it was an impossible task for me to find out what that was for all of their customers.

"Q. But it was not an impossible task when it came to a distribution in allocation of these expenses within the Bell System, to find what the sales of goods were there, the same as it was to find what sales were to Bell and non-Bell in making that allocation, was it? You had that information, didn't you?

"A. The sale of goods?"

2276 Of course, I made an over-liberal estimate here, as I thought, for the non-Bell sales of the Western Electric Company, but a vast part of our effort has nothing to do with this when it comes to the associate companies.

2279 The Western Electric Company was never billed for the amount proportioned to the non-Bell business of the Western on Exhibit A-116. We make no billings of the expense of development or research for development matters. The portion of that expense which I have allocated to the non-Bell business was never paid for by the Western Electric Company.

The figures appearing on this exhibit (A-116), representing the sales figures on the non-Bell business for the period beginning with 1925, represent the sales of the Western Electric Company to their customers, and, in so far as Graybar was a purchaser of telephone apparatus or lead covered cable, they represent the sales to it. They do not, as I understand
2280 the figures, represent Graybar's sales of those things to the ultimate consumer. The price would be the price to Graybar and the distributors.

The development work of the Department of Development and Research, I assume, only goes to a portion of the 100,000 items and 20,000 combinations of the Western Electric Company. I do not know what all of those items are, but I think it would be a fair assumption that there were a considerable number to which you could apply little, if any, of this cost of which we are talking.

"Q. And of those 100,000 items, and 20,000 combinations, I suppose it is a fair assumption that the non-Bell sales are only of a portion of those items, is it not?

"A. I should think that was a fair assumption in these classifications; yes, sir."

I do not know to what portion of the 100,000 items the development and research expense in a given year
2281 applies. I do not know what per cent of those items on which development and research expense was had, applies to the Bell items, and to the non-Bell items.

"Q. Now, by apportioning among the Bell customers on the basis of plant, you assume, do you not, that the Bell customers each purchase a cross section of the sales to all of the Bell customers?

"A. On the average of the total, yes; that is the assumption."

That is the assumption in each year. I do not make that assumption and lump it over the entire period of years, but in the first allocation which I made, and which I think is the best allocation, of course, the net result is the same, whether you take it year by year, and add the results together, or whether you take the average of sales over those years and apply them. It does not necessarily assume an average in the various sub-classes of goods dealt in. The allocation
2282 which I made was based on percentages of our work, and not to the classes of goods. I do not entirely leave out of consideration the goods to which the result of our work may be applied, but I leave it out of any detailed attempt to allocate because it is quite impossible for me to do that for the reasons that I have mentioned, that the work, or the effects of the work, appear in so many different classes of goods.

I presume that the different classes of goods are purchased in different quantities in a given year and also the purchases vary throughout the year considerably.

2283 In Exhibit A-116, I am not assuming that the non-Bell customers paid, as part of the purchase price of the plant items which go into their capital account, for any part of the development and research, which are the figures which we are here concerned with, because there has never been any billing of that expense. They are undoubtedly paying for their proportion of the development expense of the Western Electric Company in the creation of the things which it sold. I do not think that the benefit of any items of development and research reflects itself in the price charged by the Western Electric Company to the non-Bell customers, except in the extent to which that benefit has made it possible for the Western Electric Company to sell this type of product at a lower
2284 price than they would otherwise have been able to do. I do not say that the Western Electric sells to non-Bell customers for a price that is less than the price to Bell customers, by the amount of development and research expense that may be allocated to those goods.

So far as I know, the development and research expense reflects itself in the goods that are sold by the Western Electric Company to non-Bell customers only in its effect, and in the manner which I have indicated in the answer to the question just preceding.

The results of the work of development and research are reflected in the goods sold by the Western Electric Company to non-Bell users and it is for this reason that I assumed that it was fair to make an allocation of benefits.

"Q. And if the results of that work as far as prices are concerned, are found in the selling price of the Western Electric Company to the non-Bell customers, in that case it goes to capital accounts in respect to those customers, while in the case of the Bell customers it goes as an operating expense by reason of the license contract, does it not?

"A. Well; I cannot answer that question because I do not know; I am not an accountant, and I do not know how people keep their books."

2285 In Plaintiff's Exhibit A-116, I do not include in the non-Bell field special commercial products; those are specifically excluded, as indicated in the heading of the exhibit. I do not, in any of the exhibits which I have presented, consider that any portion of the development and research expense is allocable to special commercial products. I do not do that for two reasons. First, that if any were included, I would not know how to make up an allocation, but that is an incidental reason. In the second place, because to whatever extent the benefits of the research and development work of the American Company are found in the special commercial products, those values have been paid for in
2286 ways other than by an allocation of the credit for expense of development and research.

The special commercial products which I have in mind are essentially the non-telephone and telegraph things manufactured by the Western Electric Company, which are sold and distributed either through Graybar or through Electrical Research Products. They are such things as the talking motion picture equipment, both recording and reproducing,

the phonograph devices, public address systems, and any of the things which are founded on the same fundamental considerations which underlie telephone and telegraph apparatus, but which do not have a use, or only an incidental use in the plant of telephone and telegraph companies. They are things
which are for use in fields outside of the communication
2287 field—radio. Those are the results of development and research work. I said that there were two reasons why I did not take them into account in my allocations, of which one was possibly an incidental reason; that is, if there were values there which should be considered in the allocation I did not know how to make that kind of allocation, but I said as the second, that is, those values have been taken care of in an entirely different way by the payment of royalties to the American Telephone and Telegraph Company by the Western Electric Company.

In making my allocations for the Bell portion of the development and research expense between the associated
Bell Companies on the one hand, and the Long Lines on
2288 the other hand, on the basis of plant investment, I assume that the problems of the exchange and the problems of the Long Lines are in some respects identical, in some respects similar and in some respects quite dissimilar. So far as the fundamentals are concerned, and this is increasingly true, the more fundamental is the type of research and development work, they are similar. As you get toward the part of research and development which is more specially directed to a particular end, the dissimilarity increases. Those differences are not taken into account in the allocations which I take into consideration for this very difficult thing. They were taken into account in the attempt to check the results of that preferred method by utilizing these artificial classifications of
our analysis of expense accounts, and they are reflected
2289 there by the fact that different kinds of items are used as the basis of allocations in those classes.

I am only familiar in a general way with the contracts under which the royalties from the Electrical Research Products and the Western Electric Company, to which I referred

a moment ago, are provided for. The general basis is that the Electrical Research Products pays, or the Western Electric Company pays, to the American Telephone and Telegraph Company, a percentage on the sales price of apparatus which is sold for use in this special commercial products field and also that in some cases (I am not sure whether it is in all cases, but I think it is) where royalties for use of these kinds of things are paid to Electrical Research Products or the Western, a portion of such royalty is paid to the American Company. I am not familiar with the exact details of
2290 how that is worked out. I presume that there is only a small number of contracts between the Western Electric Company, American Telephone and Telegraph Company and Electrical Research Products. I am not sure that they are all in the form of contracts, they may be in the form of an interchange of letters.

The Western Electric Company and Electrical Research Products pay no compensation to the American Telephone and Telegraph Company for the benefits of the research and development work of the American Company which
2291 applies on business to the associated companies. I do not know why it was that the American Telephone and Telegraph Company did not adopt the same method of compensation for its development and research work on sales of goods to the associated companies; it goes away back; it goes far back of my time.

The percentage figures in column 4 of Exhibit A-117 were given to me by Mr. Crunden and are in evidence on this case.

"Mr. Haight: We wish, if your Honor please, to note a motion at this time to strike, in respect to that, for the reasons given in objecting to Crunden's Exhibit A-113."

2292 In the first exhibit which I put in as the summation of the allocation divided down to the Chicago area, in making my allocation of the Chicago area I considered it as a unit made up of exchange plus toll on the one hand, as against Long Lines and exchange and toll for the balance of the System. The figures in the last column (column 5), which are expenses allocated to the Chicago area, are the result,

first, of taking out the benefit to the non-Bell sales and then allocating the remainder to the Chicago area in the ratio of its plant investment to the total plant investment, and in that sense they take whatever plant is found in the Chicago area and relate it to the total plant, both local exchange, local toll and long distance toll plant of the entire System. In
2293 the Chicago area there is included whatever plant is in the Chicago area, both plant used in exchange as well as in toll. On the other hand, it is the Long Lines, plus both exchange and toll plant, referring to use of all of the other associated companies. I cannot, for the reasons I have stated, separate the expense of development and research for the Chicago area allocating to toll plus the Long Lines on the one hand, and the expense allocable to exchange on the other hand.

2294 On Exhibit A-118, on the sheet for 1927, the per cent that I have allocated to Long Lines, in the second column of figures, for central office systems and apparatus, is 4.5 per cent. That is central office equipment. That is made because of the long distance toll boards and the fact, as I understand it, that on the books that portion of invest-
2295 ment in repeaters, which is large in the Long Lines and which does not relate to the fundamental things referred to below, is classified as central office equipment. I do not know what the board-to-board theory is.

"Q. Well, you assumed that as far as the Long Lines are concerned, they end at the toll boards, and you did not include in Long Lines anything in the exchange plant that should be allocable to Long Lines. That is the basis on which you have arrived at this 4.5 per cent in regard to the first block, central office systems and apparatus, is it not?

"Mr. Blackman: Just a moment, Doctor, just a moment. I object to that. I think that is introducing a pure question of law. The witness has stated that he has dealt with the plant owned by the Long Lines and the plant owned by the other companies. Now, of course,—

"Judge Wilkerson: Well, you understand his answer to be this, then, that in determining the part of the aggregate plant

which is owned or which is represented by the Long
2296 Lines, he has not included any percentage of the plant of the local companies.

"Mr. Blackman: Yes, certainly. His answer is perfectly plain.

"Mr. Haight: All right.

"Mr. Blackman: And may I say—

"Judge Wilkerson: We all understand it alike, then.

"Mr. Blackman: May I say right here, if your Honor please,—

"Mr. Haight: That answer satisfies us.

"Judge Wilkerson: I so understand him:

"Mr. Blackman: Yes.

"Judge Wilkerson: I so understand his testimony.

"Mr. Blackman: Yes.

"Judge Wilkerson: He has not gone into—

"Mr. Blackman: No.

"Judge Wilkerson (continuing): —the question of how much of the value of the local plant is to be taken out of the local plant and put over into Long Lines for the purpose of making these different allocations.

"Mr. Blackman: Right.

"Judge Wilkerson: He has dealt with Long Lines as he finds it.

"Mr. Blackman: Yes.

"Judge Wilkerson: And with local plant as he finds it.

2297 "Mr. Blackman: Certainly.

"Judge Wilkerson: And as to these other theories, he leaves them to the court.

"Mr. Blackman: Yes, sir, and whatever the court determines the allocation to be, will allocate the proper amount.

"Judge Wilkerson: It may be that these figures which he gives are subject to some correction, and if after considering it, the court will say that the percentage of local lines should be put over into the Long Lines, it might increase that.

"Mr. Blackman: Yes, sir, and the way we have treated it is allocating some of them to the Long Lines, because we have

allocated a part of our total expense, including the license contract payments, to the Long Lines.

"Judge Wilkerson: Well, your tables show the basis on which they are made, do they not?

"Mr. Blackman: Yes, sir, and whatever basis the court takes will automatically allocate this.

"Judge Wilkerson: I understand.

"Mr. Haight: Of course, we are not forgetting that the Supreme Court has already taken a basis."

2298 In item 4, on the page for 1927 of Exhibit A-118, I allocate nothing to Long Lines. The first subheading under Item 5, on the same sheet, which is "Voice Frequency Telephone Equipment and Circuits", I should not think has to do with toll systems only; I would not say so. I do not see why that should apply. Voice frequency telephone equipment and circuits might apply to any part of telephony.

2299 I think our work applied to things other than toll systems. Without having examined in detail all of the different things that were done in all of the years to find that there was a year in which they did not apply to all, I would say that in all the years the work under this subhead applied to all. In making my allocations on my exhibits, I did not know whether it did or not. This classification is one which, as the table indicates, is lumped with the two following ones and all of the matters referred to in all three of these classifications are of such a fundamental character and, in many cases, are so remote from the immediate application of the plant, that their benefits, direct and indirect, are found in many, if not all, of the other classifications and in proportions which make it impossible for me to allocate them narrowly against classes of plant and conditions of use. The

2300 specific application of the work under the next subhead, "Carrier Telephone Equipment and Circuits" (which is a very new work), at the present time has its present-day uses only in toll lines to any considerable extent. But it is a character of work which, because of the reduction in the length of the lines over which it is economical to employ it, is approaching and will reach the place of a possible large

use in the local exchange area. All of the work which relates to transmission in its initial specific application, where there are very new things, almost inevitably finds its first direct use in toll service and grows down into the local exchange service, just as the great bulk of all work relating to switching, which is fundamental in character, follows the reverse course.

2301 I think as a broad statement that most of the things as things, which I have grouped under items 5, 6 and 7 as being of a more fundamental nature, have so far found use in the toll service. It is not true of all of the items, as you can see by going down the list. Take in classification 7 (Apparatus), which on this sheet happens to be a small item; that sort of thing, I presume, would be found, if we could analyze it, to be as much or more in the local exchange

2302 thing. Presumably the next item similarly. Loading coils have been used enormously in the local exchange area. But, in general, the newer things, as things, have appeared in toll rather than in the local exchange area; I am referring now to items 5, 6 and 7. Special commercial products have come substantially very largely from those classifications 5, 6 and 7, plus, possibly, something out of classification 4, and, in so far as it involves things used in switching, out of classification 1. That, however, is a relatively small matter. The main values have come out of classifications 5, 6, 7 and 8.

2303 Uses that have come out of these classifications have been largely in Long Lines and in the toll plant of the associated companies. Not all of those uses, as I have indicated, are benefits to the Long Lines. Some of them have been serious burdens to the Long Lines. All of the radio uses and all of this picture transmission of classification 5 have not been benefits but quite the reverse.

I am not competent, I think, to testify accurately on whether the benefits that have been derived as between Long Lines and toll have been mostly to the Long Lines, because some of these uses in the local toll plants have been extremely large, as, for instance, the case of certain of the carrier installations, where

in the later types of carriers, they practically all have gone into the plant of the local companies. Further, I am not competent from my knowledge to testify to the relative benefits of, say, such a thing as loading, where there has been an enormous usage in the plant of the associate companies.

2304 Broadly speaking, these devices, as classified in items 5, 6 and 7 in Exhibit A-118, have, in general, found their uses first in the Long Lines, because of the fact I mentioned that these new things of transmission, when used as things and when in the stage of being crude and expensive, are, because of the value or the cost of that kind of service, first employed there. Oddly enough, some of these things that we are talking about found almost as early an application in the toll plant of the associate companies as they did in the plant of the Long Lines, as, for instance, such things as carrier; but, if I am not mistaken, the second installation of carrier was on the toll lines of the associate companies.

"Q. And that would be with companies over many states, would it not, and not in a concentrated area like Chicago, is that not true?"

That kind of thing would not be likely to happen in a concentrated area like the local exchange area of the City

2305 of Chicago, unless by chance there happened to be some very peculiar condition existing. However, it would occur on the lines of associate companies of considerable length. My understanding is that the Long Lines did a large intrastate toll business within the territories of the licensees prior to 1925, but how large it was I am not in a position to state, as I do not know. I know that short-haul toll business was more a part of the Long Lines before 1925 than it was after 1925. I do not know when this 40-mile limit was instituted.

2306 The Long Lines have what are known as full or part time telephone subscribers, but my understanding is that the instruments which these subscribers use in availing themselves of that service and the plant which they use in reaching the terminals of the Long Lines are the same local plants which they use in connection with their other telephone service. As I understand it, the Long Lines does not put in

special sub station terminal equipment which is connected only to the Long Lines' plant. In that sense, the Long Lines does have subscribers, both telephone and telegraph. The American Telephone and Telegraph Company has direct subscribers in the sense that they have made an arrangement with people to furnish a service which the Long Lines proceed to furnish with the help of the associate companies and for which the associate companies, as I understand it, are remunerated.

I did not intend to say on my direct examination that
2307 the rate case expenses are allocated to all of the licensees.

So far as Development and Research Department expense in connection with rate cases is concerned, it becomes simply a part of our general expense. No attempt is made to allocate or apportion such expenses. The only allocation, so far as I know, that has ever been made of these expenses is this allocation which I have made in an attempt to arrive at a figure. Since they are a part of the general license contract services, in effect they are pooled among all of them.

The expense of the Development and Research Department does not include expense incurred by the American Telephone and Telegraph Company in purchasing licenses or patents from owners outside of the Bell System. The only item referring to patents there has to do with internal expenses in the Bell System and that is transferred out of my
2308 department into some other, but it relates only to expenses which are charged to that general classification and which are incurred by our own people.

2309 "Q. Development and research work, let us say, is done upon two items during one year, and the cost of each is $1. One of those items is used immediately, and the other item is not used for nine years. Now there is the simplest situation imaginable, too simple to actually occur, of course.

"Now, what I am trying to get at is this: when you take the expenses for a particular year, you ascribe those expenses to that year, but you do not thereby make any division as to results in uses, do you?

"A. No.

"Q. Now in looking at your allocations, how shall we size them up? Shall we say that we have distributed those benefits in use over the entire period, or would you say that there is any relationship between the allocations which you have made and those year by year results?"

I think I can give the clearest indication of the base on which I worked by taking as an example the year 1931.
2310 Take the last allocation in that book, the year 1931, the year just passed, in which a large over-all expenditure for research and development work was made. Now I have already testified that in my judgment the fairest way to attempt an allocation of that expense between the several corporate recipients of that benefit is to apportion the net cost of the work, after deductions and allowances, on the basis of the plant values, because this work relates to physical things, which are plant. Now, what base have I on which to apply this allocation? I obviously have not the base of a plant ten years hence, because I know nothing about it, nor five years hence, nor one year hence. I can guess, but I have no base. I obviously cannot apply that base to a year preceding the present year, because I would apply a future condition to a past situation. Consequently, I am driven between those two alternatives, to the one gross base which I have available, which is the size of the groups as they exist at the present time, namely, the basis of the relative plant investments as of the year in which they occurred. And the same pertains with regard to every year back.

Now you might argue with regard to the earlier years,
2311 taking the year 1923, that eight years have elapsed, and that I consequently could apply a better figure in regard to the allocation to the year 1923, because of the fact that I have lived eight years beyond that. I might admit that that was so, but if I admitted that, and did it, I would be in trouble with all of the subsequent years, because it would force me into an assumption as to what was going to exist at some time in the future. So that the allocation has been made on both bases, both on the basis which I think is most fair when we come to consider a character of work of this

kind which is dealing with the future, and also in the attempt which I made to check that against these artificial classifications by taking each year, year by year.

2312 I have here a memorandum which was prepared for me some months ago, showing the total expense incurred under the classification Radio by the Department of Development and Research for the years 1910 to 1931, inclusive, which, of course, includes both the directly incurred expenses and the expenses billed by the Bell Telephone Laboratories or its predecessor, the Western Electric. I have forgotten who prepared this memorandum. I have no reason to doubt its accuracy. It was taken off from our records in the regular course of business. It is something that was prepared in my department and under my direction and I am satisfied with it.

2313 I have not gone back and personally checked it against the figures but I am satisfied with it. It is the kind I use every day in the conduct of our business.

2314 (Which said document was marked for identification as Defendants' Exhibit D-93.)

The pencil marks on this exhibit are just my notations; summations of some sort or other.

"Mr. Haight: Yes, and the pencil notations there will be disregarded."

2315 The items of expense appearing on this sheet (D-93) relate to the items of main classification 6 and its sub-classifications. Of course, in any particular year the expenses under some of the sub-classifications are different from others, because in this year I am looking at, which is 1927, there are some items on here which existed at that time, such as ship-to-shore, which did not exist in the earlier days. But, in general, they relate to the work of that main classification and I am not in a position at the present time to make any finer division than is shown in the last column of this sheet.

As I have stated on two or three occasions, the Long Lines has run its radio service at a loss. In saying that, I included as to plant the Long Lines' investment in the radio plant utilized or employed in the giving of the transoceanic

2316 service; that is, the transatlantic, the South American, Bermuda, Central American and Hawaiian services, and

the radio plant involved in the giving of ship-to-shore service, but did not include investment in the wire lines which connect those radio plants into the main network. I did not include revenue from leased lines used in broadcasting service; the figures that I gave relate strictly to the radio telephone service of the American Company. I understand that the revenue from the leased lines used for broadcasting service is a large gross revenue, but I do not know what the net
2317 revenue is. I did not include any profit of the Western Electric Company or of the Electrical Research Products Company on the sale of vacuum tubes; I included merely the plant investment of the Long Lines in its radio plant. There is no relation between the radio plant and the sale of vacuum tubes or transmission for broadcasting.

I have not in detail the figures of the loss incurred in the ship-to-shore and transatlantic services. I gave somewhere in my testimony the rate of loss at which the service was being conducted as of two or three months ago, which was, at
2318 the time, about $600,000 annually. They are the only figures I have. The best way to check that, if it has to be checked, would be to get someone from the Long Lines Department who is conversant with the details of those figures.

The figure which I used with regard to the investment of the Long Lines as of January 1, 1932, in its radio plant was approximately $5,000,000. Specifically, the figure which was given to me and which I have here is $4,947,000. The figure which was given to me as the rate of annual operating loss on that service was approximately $600,000. I do not have with me the figures on the gross earnings and the expenses.

2319 *By Mr. Goldstein.*

"Mr. Goldstein: Doctor, there were furnished—I would like to identify as Defendants' Exhibits D-94, D-95 and D-96, the sheets showing the expense of the Department of Development and Research for the years—1920 being D-94, 1921 being D-95, and 1922 being D-96, those sheets comprising the expenses of the Department of Development and Research

of the American Telephone and Telegraph Company, and that portion of the expenses of the Bell Telephone Laboratories which is chargeable to Development and Research, which sheets were furnished to us by the American Telephone and Telegraph Company.

"The Witness: These are

"Mr. Goldstein: Your exhibits.

"The Witness: These are photostat copies of the sheets corresponding to that?"

2325 *Re-direct Examination by Mr. Blackman.*

The only assumption that underlay my prorating of the expense of my department between the Bell and non-Bell sales was that per dollar of sales to the non-Bell customers there would be as much of our development work as per dollar of sales to the Bell customers, which, as I indicated, I
2326 felt was a very liberal assumption. In making that, I included the sales to the Bell Telephone Company of Canada, which is one of the licensee companies and from which we receive revenue. This apparatus and this work with which I was dealing was done primarily for the Bell customers and to fit into the plant of the Bell operating companies. On that basis, in my opinion, it is safe to assume that there was at least as much of our work included in the apparatus which they have used as in the apparatus which the non-Bell
2327 people have used. For a given distance and a given class of service, the character of the toll lines of the associate companies and the toll lines of the Long Lines is substantially the same. The American Telephone and Telegraph Company has some lines which are longer, although in some of the associate companies their long toll lines are almost as long as the longest American Telephone and Telegraph Company lines and they are much longer than the average of the American Telephone and Telegraph toll lines. At the other end, the associate companies have toll lines which are shorter than the shortest toll lines of the Long Lines, and, on the average, the length of toll lines which the associate

companies employ is obviously less than the average
2328 length of the lines of the Long Lines; but the average length of the toll lines of the Long Lines is much less than the length of the longer lines of many of the associate companies. It is not unusual to find lines of a thousand miles or more in some of the associate companies.

I think that carrier and other developments to which I have referred under 5, 6 and 7 would be found on the intrastate lines of the Illinois Bell reaching out from Chicago to points such as Cairo and Springfield, and my recollection is that it is so found. Certainly, the distances and character of plant are such as to make it available there.

The one device which is absolutely fundamental to
2329 talking motion pictures, both as a direct tool and as an indirect tool, is the vacuum tube. Without the vacuum tube, the talking motion picture art as we know it today could not exist. As I have already testified, the original vacuum tube patent was granted to De Forest in 1908, and that means that it expired in 1925. We never obtained a patent on the high vacuum tube which was developed by our department. There was patent litigation over it for many years, which was decided finally by the Supreme Court last year.

The thing which came to be known as the high vacuum, as
applied to these tubes, was a thing which was done by
2330 Dr. H. D. Arnold, of the Bell Laboratories, at the time the De Forest vacuum tubes were first brought to our attention as possible repeaters and were found to be unsatisfactory. Neither Dr. Arnold nor Mr. Colpitts, his immediate superior, nor our Patent Department, nor I at that time thought that the mere bettering of the vacuum was a subject matter for patent protection, and we made no attempt to patent that thing which was so vital to the vacuum tube and changed it from an incidental tool to a very powerful weapon. And that went on for some time until we found out that a patent had been applied for by the General Electric Company on identically this work, and that caused us to make an application for a patent on this work of Dr. Arnold, which we submitted to the Patent Office with the statement that we did not

think that this thing was a patentable invention, but if we were wrong in our judgment and they held that it was a patent, we thought that we were entitled to that. That commenced a litigation, or a long train of contests in the Patent Office, interference contests, and later in the courts of the District of Columbia, and in the Federal Courts, particularly in the Wilmington District, with regard not only to the matter
2331 of patentability, but with regard to the inventor, if patentable novelty were found. And that, to make a long story short, was finally decided by the decision of the Supreme Court this past year, in which they held, in the line of our original contention of no patentability, but made the statement that had patentability been shown, Dr. Arnold would have been adjudged the inventor. And during the course of this litigation and interference contest a patent on the high vacuum did issue to Dr. Langmuir of the General Electric Company on this very identical thing, and this patent was later, of course, by this decision and by the decision of the lower courts, declared to be invalid and of no effect. Throughout that litigation, the position of the American Telephone and Telegraph Company was always consistently that the device was not patentable and many of us testified to that effect.

There were other devices which were developed by the American Telephone and Telegraph Company, or the Western Electric Company, which are fundamental to the talking
2332 moving picture; there are two which I would consider as fundamental: One was the filter patents (which are the Campbell patents which I referred to previously and which were issued, I think, in 1917). These were basic patents which were very instrumental in the development of this talking motion picture art, but which in themselves are not fundamental to the art itself. Then there is the so-called Lowenstein Negative Grid Battery patent, which is owned by the American Company and has been developed by it, although the invention was not made there. That was a patent which was purchased and developed by the American Company. Those two patents, so far as I can think, are the two, in addition to the vacuum tube, which I would call fundamental.

There are, of course, a large number of incidental patents, but they are different in character from these very basic
2333 ones, and, I think, would not prevent the development of the talking motion picture art. I have been given to understand since I have been here this week, that in the decision of the Federal Court in a case involving this Lowenstein patent and other patents of a like nature, the Lowenstein patent has been declared to be invalid, but I have not seen the decision and I do not know just what the court said.

2334 Under the exchange of licenses which I referred to heretofore, the General Electric Company, the Westinghouse Company and the Radio Corporation of America each obtained from us the full freedom to enter into the talking motion picture field under our patents. Some of these companies actually entered into that field, and are in it today. Others have also entered the field.

Of the local exchange business, the toll business of the associate companies and the business of the Long Lines, it is the local exchange plant which is most affected by that factor in the telephone business which I referred to as the reverse
2335 of economies coming from mass production and illustrated by an example involved in the increase of the number of subscribers. That is because the element of switching, which is a large and predominant factor in the cost elements of local exchange service, is a relatively small factor in the case of Long Lines service.

I was asked in my cross-examination whether the profits of the Long Lines, as compared to the associate companies, did not show that our development work had benefited the Long Lines more than the associate companies. I should say that there is not the slightest connection between the two, because the whole question of rates and price paid for service is involved and that might completely overshadow this thing wherever service can be given, and, as a matter of fact, I think it has.

2336 I did not intend to make any claim, on my direct examination, that fine wire was introduced during the period

covered by my exhibits and I do not think I made any such statement. The only thing I remember having claimed with regard to fine wire was that the results of the technique and tools developed as a result of that work under those classifications we discussed so much (5, 6 and 7) had made the use and benefits of fine wire cables much greater to the associate companies than would otherwise have been the case; it extended the use. Fine wire circuits are both cheaper and less efficient telephonically than circuits with wires of larger diameter, larger gauge. From the standpoint of cheapness, it is desirable to use them. From the standpoint of their reduced efficiency, it is sometimes difficult to use them. But, because they are less efficient than wires of a larger diameter for a given set of conditions as regards terminal apparatus
2337 and all other things, and with a given standard of transmission, the introduction of fine wires limits the distance over which you can give service with a predetermined standard of efficiency. Now, what I meant in that answer was that the work growing out of the efforts under classes 5, 6 and 7, had improved the efficiency of the things other than the fine wire, the terminal apparatus, the matter of extraneous noise, and other things there, so that you had a greater efficiency in the things other than the fine wire cables than before this work had been done, and so a greater margin of use to employ circuits of less efficiency than those which existed in the art before; and that means that you had an opportunity to use longer lengths and more fine wire cable without reducing the efficiency and reliability and general satisfactoriness of the service to the subscribers, and, in many cases, with the elements of actual improvement. That is, before we did this work, fine wire might be usable, say, for distances of two or three miles with satisfactory results. Now, after we did the work, it was usable for four, or five or six miles, we
2338 would say. Using these distances as illustrations, that is what I had in mind.

In speaking of the gauges of wire, the size of the wire goes down as the number goes up. In the standard wire gauges, the largest wires have the smallest numbers.

There is no research or development organization, that I know of, anywhere in the world comparable to that of the American Telephone and Telegraph Company, either as to size, or scope or object.

I was asked in my cross-examination if the kind of information we furnished to the operating companies would not go in as a part of the engineering cost of constructing the new plant. What I had reference to was the kind of information derived from development and research which provides new engineering knowledge, utilizable by men who have to
2339 engineer specific plants, and is usable either to permit them to employ new things or to remove old things from the plant. It is an addition to the store of their engineering knowledge, and without it they cannot make application of these new things. It is the kind of information which they can only obtain themselves, on the assumption that the associate companies themselves maintain research and development organizations comparable in size and scope to that maintained by the American Company, if the American Company did not furnish this information to them.

None of our work is the kind that enters into the cost of general engineering. It would be over and above that kind of thing, if by "cost of general engineering" you mean those costs which become a part of the cost of constructing a plant. The information to which I referred as being furnished by the
Department of Development and Research is of the char-
2340 acter of furnishing new engineering knowledge to people to use as they want to use it.

I was asked in my cross-examination what proportion of the Long Lines plant was involved in switching, and I stated that I did not know. I was then asked whether I knew that the proportion was small or large, and I said, "I should say it was considerable." I have looked into that matter and refreshed my recollection since my answer, and have satisfied myself generally as to what that proportion is. That proportion is certainly less than 10 per cent and certainly not to exceed that amount.

I do not think the use of the filter is a necessary thing in

the making of a satisfactory talking motion picture. However, I think it is a convenience, and, in some cases, probably can be used to slightly improve.

In answer to Mr. Haight in my cross-examination I said that the results of the development of the kinds I was referring to, both the tools and the things that were used in
2341 the plant, had the effect of making costs of construction and costs of operation less. I did not mean by that that it costs any less, because of any work that we have done, to install a mile of a particular kind of underground conduit, or a mile of a particular kind of underground cable. I did not have that in mind at all. I did not have in mind at all the cost of actually installing a mile, say, of full sized cable today as compared to some preceding time. I have no knowledge as to what that relationship is, because it involves such an enormous number of factors, of labor costs and obstructions in the streets, and what not. What I had in mind was that, as a result of our work, cable so installed provided, we will say, more circuits for the use of the telephone company. That is, we would get more wires in a given size of lead sheath and by our carrier we would make each wire do double duty.

That is the kind of thing I mean. As far as I know,
2342 the cost of installing a pair of wires on a pole line today, assuming the cost of the wires themselves to be the same, is higher than it was some years ago, and yet that same pair of wires, because of this work, is capable of carrying many messages. Now, I did not have in mind anything relating to the cost of actual installation.

I think these transoceanic services have a very large publicity value and a valuable publicity value. My reason for that feeling is not only the tremendous amount of free advertising which the installation of those services has produced, but is also the result of the conversations which I have had with innumerable people who look upon that as a great achievement, and also because of the fact that in connection with the opening of these services the associate compa-
2343 nies have considered it important to make, particularly in the early days of the extension of the transatlantic

service, public functions out of the inauguration of that service as an extension of the service of their business.

I am not competent to say whether the loss that the Long Lines incurs on this is worth the money in its advertising and publicity effect on the associate companies. I can say that in my opinion the expense of the loss incurred by the Long Lines for the benefit of the Bell System, which means the associate companies, is thoroughly worthwhile, not only to the Bell System, but to the public which we serve.

Re-cross Examination by Mr. Haight.

The information furnished by the Department of Development and Research in connection with the building of plants is, in my judgment, necessary for the introduction of new things into the telephone plant to improve it, to build
2344 new plant involving those things. I cannot see how many of these new things can be introduced without the engineers of the local plant knowing what they are, what they can be expected to do, and what they cannot be expected to do. Obviously, I can postulate the building of a plant of the art of today without the introduction of any new information from development and research beyond what has already been given, but I cannot postulate the building of the plant of tomorrow, involving new things, without the Department of Development and Research, or some similar department, furnishing the engineers of the operating companies with the information regarding those new things. In other words, I cannot postulate an improved plant being installed without somebody furnishing information about the things to improve it.

If I postulate the construction of a plant in 1923, let us say, without all of this information furnished by the Department of Development and Research, that plant would
2345 not be a practical plant for the services that are now furnished. Such a plant I could not contemplate as being then constructed outside the Bell System, that is, certain parts of that plant as it was constructed in 1923 it is difficult

for me to postulate being constructed outside the Bell System in that year.

In mentioning some of these patents, like the Lowenstein patent and the invention of Dr. Arnold, I was not suggesting that there should be a reduction in the license payments on account of having collected what in effect are royalties on void patents. I did not call attention to the De Forest radio
2346 patent, issued in 1908, and its expiration to indicate that nothing had been done since. That is, I still justify the expenditures made upon investigations relating to vacuum tubes since the date of the De Forest invention. Even the De Forest invention in its particular embodiment at that time had to be changed to adapt it to the use of telephone repeaters. We did develop it and that instrumentality so developed was later used in these various radio uses.

The Campbell patents that I referred to related to filters. I do not know that the specifications of these two patents are identical; I have not looked at them for a long time.

"Q. Did you know that the applications in those two pat-
ents of the inventions were in connection with wireless
2347 telegraphy, wireless telephony, multiple high frequency wire telephony, composite telegraph and telephone lines, and in particular with telephone repeater circuits? It does not mention radio at all.

"A. What was the first thing that you read?

"Q. The first thing I read was wireless telegraphy.

"A. Well, isn't that wireless?

"Q. Quite true.

"A. You said that it did not mention that at all.

"Q. No, but these other radio uses, I mean, the other uses of the vacuum tube.

"A. Oh, certainly not."

Those uses were all developed after that and I think I testified that the influence of this filter art was in permitting us to do many things which were not contemplated by the inventor.

Through the efforts of Dr. Arnold and others we secured a more perfect vacuum, that has been a benefit, notwithstanding the fact that the patent was not secured. In my discussion

of patents, I have not intended anywhere to imply that our failure to secure the patent has not justified our research
2348 and development work. So far as we are concerned, I doubt whether we would have changed the character or amount of our development work one iota if the patent law had been abolished.

Many of these things that are of an engineering type are things in which no invention resulted whatever, but they were nevertheless mechanical improvements and improved the devices that were in use in many parts of the Bell System. There were no patents upon fine wire as such. I presume there are patents on fine wire cables or on the parts of fine wire cables, and I presume there are patents upon various arrangements and uses of these arrangements.

2349 The figures in column 2 of Exhibit A-119 come from Mr. Crunden's Exhibit A-113.

"Mr. Haight: We point that out, if your Honor please, only that we may make a motion to strike this exhibit and the testimony regarding it, for the same reasons that are assigned in connection with Exhibit A-113, presented by Mr. Crunden.

"Judge Wilkerson: I think, before you start this
2350 other witness, I think the record is closed as to that motion for the inspection of documents, is it not? Judge Evans and I granted the motion as to certain documents, and I think it was understood that upon the present record we were not inclined to order inspection of the other documents mentioned in the motion. I think Mr. Adcock took an exception to the ruling.

"Mr. Adcock: Yes.

"Judge Wilkerson: We have gone over the matter again since the argument, and adhere to that view about the inspection of any documents other than the ones the inspection of which we directed at the time.

"Mr. Adcock: Of course, our exception may stand to the Court ruling on that?

"Judge Wilkerson: At the time we directed the inspection of certain documents, we said we were not inclined to direct

the inspection of the other documents, but that we would look at them again and consider the grounds which were assigned in the motions, but we think we have gone as far as is proper upon this record in directing the inspection of documents.

"Mr. Adcock: Then the exception that we asked to appear in the record may apply to this ruling now?

"Judge Wilkerson: We wanted to make sure that the record was closed, and no one expected the Court to do
2351 anything more on that motion."

ALLAN B. CRUNDEN, recalled as a witness on behalf of the plaintiff, having been previously duly sworn, further testified as follows:

Direct Examination by Mr. Blackman.

May 12, 1932.

I prepared the sheet marked for identification as Plaintiff's Exhibit A-120. I obtained the information from certain reports of the Comptroller's Department, which are stated at the foot of the document. All of these documents have been available to the defendants. The individual reports of the separate operating companies which have been under discussion here do not immediately underlie those or any of them. That is, the reports underlying this sheet are cited on the document and they do not include reports of the individual companies other than the Long Lines and the Bell Tele-
2352 phone Company of Canada. The rest of the information is contained in a report described there as C. R. 51-A. That is a report made in the regular course of business of the American Telephone and Telegraph Company.

(Plaintiff offered sheet marked for identification as Plaintiff's Exhibit A-120 in evidence.)

2353 Plaintiff's Exhibit A-120 is the per cent of the Long Lines of the total telephone revenues, of the total exchange and toll and miscellaneous operating revenues of the Bell System, including the Bell of Canada combined. It shows

the percentage relationship between the revenues of the Long Lines and the revenues of all the other companies combined, including the Long Lines. That is shown in the last column to the right.

The sheet marked for identification as Plaintiff's Exhibit A-121 is similar in general form to Exhibit A-120 but it shows the ratio of percentage of the total telephone revenues of the Chicago area to similar revenues of the total associate companies, excluding the Long Lines and including the Bell Telephone Company of Canada. I got the information for this exhibit from the same sources as I did with regard to Exhibit A-120.

2354 (Plaintiff offered document marked for identification as Plaintiff's Exhibit A-121 in evidence.)

2355 *Cross-Examination by Mr. Goldstein.*

In both Exhibits A-120 and A-121, I compiled the statistics as to the operating revenue of the associated companies from C. R. 51-A. C. R. 51-A is a summary statement which is compiled, in turn, from M. R. 1 from each of the associated companies of the Bell System. Each of these reports of each of the associated companies that come from the associated companies to the American Telephone and Telegraph Company were the M. R. 1 reports to which the defendants were denied access.

"Mr. Goldstein: We object to the introduction of A-120 and A-121 on the ground the sources have not been made available to us."

"Judge Wilkerson: He says you are introducing a tabulation or document that you have not let him see. Now, is that true?

"Mr. Goldstein: Sure, they have got this Court to rule that we are not entitled to them, and then they are using the same document.

"Mr. Blackman: We offered to let them see them.

2356 "Judge Wilkerson: We want to have the record clear on that.

"Mr. Blackman: We offered to let them see anything on those documents that relates to any of the figures which have been used. This is the same precise point that was raised with regard to Exhibits 99, 100, 101 and 113.

"Judge Wilkerson: You will note your objection. We will rule on it.

"Mr. Adcock: I think this relates to the matter that was to be presented to the Clerk, doesn't it?

"Mr. Goldstein: No, this is the first time we have had operating revenues involved.

"Mr. Blackman: They all come from the same sources.

"Mr. Goldstein: The sheets we have asked for in the motion that was denied to us are the identical sheets that they have taken every figure from for every exhibit from A-99 to A-121. The only figures they have not taken are the percentage calculations on those exhibits. These exhibits are taken in the aggregate, and every figure of operating revenue, every figure of operating expense and every figure of plant from every company of the associated companies was used as a basis for A-99 to A-121, and yet they have refused to let us have the documents.

2357 "Judge Wilkerson: Well, bring it up before the close of the case, we will rule on it, we will hear the motion, and rule on it.

"Mr. Blackman: I understood, your Honor, we had agreed on the procedure. We offered to bring it into court here, and your Honor said they could look at it under the supervision of the Clerk.

"Judge Wilkerson: Mr. Goldstein says he has not seen it yet.

"Mr. Blackman: We will do it any time he fixes.

"Judge Wilkerson: You may remove the basis of the objection before the evidence is closed, and, if it is not removed, bring it to the attention of the entire court, and we will rule on it.

"Mr. Goldstein: That is all."

ARTHUR W. PAGE, called as a witness on behalf of the plaintiff, having been first duly sworn, testified as follows:

Direct Examination by Mr. Blackman.

May 12, 1932.

I am Vice President of the American Telephone and
2358 Telegraph Company and have been since the first day of January, 1927. I have direction of the Information Department of that Company, which means charge of the advertising and publicity which the American Company does for the Bell System and also to advise with the associated companies of the Bell System on their public relations. That is, I advise the associated companies as to how to conduct their own publicity and I conduct general publicity in their interest. That has been the scope of my duties throughout the time I have been connected with the American Telephone and Telegraph Company.

Previous to my connection with the American Telephone and Telegraph Company, I was an editor and publisher for about 22 or 23 years.

2359 The paper marked for identification as Plaintiff's Exhibit A-122 is the chart of the organization of the Information Department of the American Telephone and Telegraph Company, which is my department. That chart is made up in the regular course of business and correctly shows the people that are employed under me, and, in a general way, their duties.

The principal expenses of my department are payment for advertising space, salaries, and the service charges that go with it, and the payments for printed matter.

The sheet marked for identification as Plaintiff's Exhibit A-123 is the sheet showing the cost of advertising placed by my department in the years 1923 to 1931. This sheet was made up under my supervision and is correct.

The first column of this sheet (A-123), headed "Paid
2360 by Long Lines Department", is the addition of the bills sent to us by the advertising agency which places the business; that is, the cost of white space, so to speak, to us. There is no pro rate of any kind involved in that; it is just the direct bills for the advertising ordered by the Long Lines Department. The Long Lines Department has a general information department of its own, which is similar to mine. We do their advertising for them, but they take care of certain other publicity of their own. We take care of this national advertising in national magazines for the Long Lines and for all associated companies. The character of this particular advertising is designed to increase the use of toll and long
2361 distance telephone, particularly in commercial business.

The beneficiaries of this advertising are the Long Lines of the American Company and the associated companies. That is, the advertising of one class of long distance would tend to increase all toll and long distance telephone.

The figures in the second column are the similar figures for the advertising placed for the Bell Securities Company and paid for by the Bell Securities Company. This advertising was for the purpose of bringing to public attention the securities of the Bell System. These securities consist of the stock of the American Telephone and Telegraph Company and its bonds, the preferred stock of certain associated companies and bonds of the associated companies and any securities in the Bell System.

In the last column is the advertising of general good will and sales and service advertising of all kinds paid for
2362 by my department. That advertising is designed to make people appreciate their telephone service, to take more telephone service, to take telephone service if they have not got it, and, in all ways, to increase the use of telephone service and the good will toward the telephone company. The beneficiaries of this advertising are the associated companies, and, to some extent, the Long Lines.

(Plaintiff offered in evidence sheet marked for identification as Plaintiff's Exhibit A-123.)

2363 The sheet marked for identification as Plaintiff's Exhibit A-124 was prepared under my supervision. It shows my estimation of the proper allocation of the charges of my department to the Chicago area; that is, the proportion of my department that is fairly allocable to the Chicago area of the Illinois Bell Telephone Company. The figures in column 1 represent the employees in my department. In column 2 are two groups of figures, the top one of which is the last figure on Exhibit A-123 and means the cost of
2364 white space, and the second figure under it all the way through each year is the rest of the expenses of my department. All the way through in each year the first figure of the group of two is taken from the last column of Exhibit A-123 and represents this advertising space that I speak of.

The figures in column 3 are the cost of the part time of one man who looked after the placing of the Bell Securities' advertising. I got that on a pro rata basis by taking the cost of the advertising division, as is seen here under Mr. Cook, and the percentage of my time, and allocating that against all the advertising we placed on a cost basis and putting the Bell Securities in for its part. Mr. Cook does not write the material that is published; he merely sees that the advertising agency does what we pay it to do. The advertising agent of the Bell Telephone Securities writes its material and the
2365 advertising agent is paid for that; that is, he gets his commission out of the magazines in which it is placed.

2366 The figures in column 4 are the figures in column 2 minus the figures in column 3.

The figures in the two columns headed "(5)" are the percentage figures that were offered by Mr. Crunden just a few moments ago, and the figures in the column to the right are merely the application of those percentage figures in column 4. The figures in column 6 are the deduction of these amounts from what you had left in column 4; that is, when you deduct column 5 from column 4, you get column 6. The figures in the last two columns are the percentages of Mr. Crunden's that were offered in evidence and the result is the direct mathematical result from that percentage.

The figure of $217,000 in the year 1923, which is the second figure in column 2, is the cost of editing, printing and issuing two periodicals and distributing them and various
2367 pamphlets which are issued by the Information Department. The periodicals are the Bell Telephone Quarterly and the Bell Telephone Technical Journal, and the pamphlets are various ones like the Magic of Communications, the Bell Telephone Almanac, and various similar ones of that kind. The magazines are circulated primarily within the Bell System for the information of the people in the Bell System, but the pamphlets are for public distribution. My department, which prepares and prints them, gives them to the associated companies and the associated companies distribute them to the public. The associated companies get practically all the pamphlets except for a few that trickle out in one way or another from my office; the means of distributing them is through the associate companies. There is something like a million and a half copies of the Almanac printed; that is
2368 the largest. The Bell Telephone Quarterly has a circulation of about sixteen thousand copies, of which about ten thousand go to the people in the associated companies and six thousand go to libraries, colleges, foreign telephone administrations, certain magazines and newspapers and certain lists of people that the associate companies have given us that they wish it to be distributed to. In that distribution there are probably four or five hundred copies that go to people in the Western Electric or the Bell Laboratories, and perhaps one hundred or more that go to other telephone manufacturing people in this country and abroad. The purpose of sending these to people outside the Bell System is partly publicity and partly to inform them of our business. People like the Western, of course, ought to know what is going on in the Bell System in order to serve it better. When we send these abroad, in the case of the Technical Journal, which is the one which goes abroad most, the hope would be that in return for the technical information contained in that that we give to foreign telephone administrations, we get back material
2369 of a similar nature. They do send us similar material; there is a courtesy interchange. You see the matter is a

very small amount of money. The Technical Journal, differing from the others, has about two thousand paid subscribers, and the money we get from them is a credit. If we were to count all of the distribution of our national advertising of every kind, I think there would be about six hundred million pieces a year.

(Plaintiff offered in evidence document marked for identification as Plaintiff's Exhibit A-124.)

2370 *Cross-Examination by Mr. Goldstein.*

There is only Mr. Cook's and my salary that is represented by the work that is done to advise the associated companies in connection with their own advertising. I would not know what proportion.

2371 The same kind of ads, the expense of which is included in my calculations, may also appear in the Bell Telephone News and Directories. They can if they want to. If such an ad does appear, there would be no payment made to the local company for that. We prepared that for their use and they use it in any way they like. We did not charge them anything for preparing it for them, only as included in this general expense. No specific charge for preparing it was made to the associated companies. In fact, they use anything we do in any way that they like.

2372 This institutional and sales advertising does not relate to the sale of stock and to the dividend returns on the stock of the American Telephone and Telegraph Company. That is the Bell Telephone Securities that I have omitted in my exhibits.

I have not available here a copy of the advertising of a character the expense of which is included in the two columns of A-123 headed "Paid by Long Lines Department" and "Paid by Bell Telephone Securities Company."

2380 "Mr. Goldstein: That A-124 is based upon Crunden's figures.

"Mr. Blackman: Yes.

"Mr. Goldstein: Our motion to strike is the same."

(Plaintiff offered in evidence exhibit marked for identification as Plaintiff's Exhibit A-122.)

2382 JOHN R. TURNER, called as a witness on behalf of the plaintiff, having been first duly sworn, testified as follows:

Direct Examination by Mr. Bracelen.

May 12, 1932.

My name is John R. Turner. I live in Glen Ellyn, Illinois. I testified in the former hearing and then stated my training and experience in the telephone business. From that time until now my duties have consisted principally of engineering pertaining to costs, that is, costs analyses of various types of telephone construction, inventories, appraisals, depreciation studies and numerous types of special studies generally pertaining to cost work. My title is Inventory and Costs Engineer, the same as at the time of the last hearing.

I have a folder, comprising ten sheets, entitled "Illi-
2383 nois Bell Telephone Company, Chicago Area, Annual Depreciation Rates, 1923 to 1930, inclusive" (which folder was marked for identification as Plaintiff's Exhibit A-125).

These papers were prepared by me or under my direction. This exhibit contains the tables of annual rates of depreciation that were in effect during the period 1923 to 1930, inclusive. The tables of rates have been arranged to show first the more recent ones, that is, pertaining to 1930 on pages 1 and 2, and the earlier rates are shown thereafter. Referring to page 1, for the purpose of illustration, the first column shows the names of each property account and the separate sub-classes of property or kinds of property for which it is necessary to determine depreciation rates. The first column of figures, under the general title "Basic Rates", shows the estimated average service lives of the different kinds of property. The second column shows the net salvage expected at the time of retiring the property, and the third column of figures shows the resulting annual rate of depreciation.
2384 The last column, designated "Composite Rates", are rates which have been determined for application to the

total investment in each primary account. Pages 3 to 10 contain similar information for previous years.

For illustration as to how the rate is derived from the service life and salvage, I will take the first item on page 1, that shows both the life and salvage. That would be the second item, designated "Manual Central Office Buildings" under the account "Buildings." There we have estimated an average life of twenty-five years for this type of building, and have also estimated a net salvage, on the average, of 20 per cent at the time of retiring each building. That means that the loss which will occur upon retirement would represent 80 per cent of the original cost of the building. This 80 per cent is apportioned over the service life of the buildings, that is, twenty-five years, resulting in an amount of 3.2 per cent of the original investment which it is necessary to provide each year in order to accumulate the 80 per cent at the time of retire-
ment. This accumulation, together with the expected
2385 net salvage of 20 per cent, will restore the original investment in these buildings. That method is known as the straight line method, the straight line depreciation expense account.

The composite rate, which, as I stated before, is the rate which has been provided for accounting purposes in order to apply a rate to the total investment in each account, is the result of applying the sub-class rates, or component rates, as we sometimes refer to them, to the investment in each sub-class of property, and the sum of that resulting depreciation expense is then divided by the total investment in the account. In other words, it is a weighted average of the various component rates within each account.

At page 10 of this exhibit, covering the period beginning January 1, 1921, is a copy of Plaintiff's Exhibit 19 on the former trial. These rates were in effect until December
2386 31, 1923. The rates that were made effective on January 1, 1921, were continued during the year 1923. The clearing account rates which are shown on page 9, that is, the depreciation rates that are used for certain items of general equipment, such as motor vehicles, and so on, were not

shown prior to 1923. We have on page 9 the rates of this type that were started January 1, 1923. The rates other than the clearing account rates were revised, and new rates placed in effect on January 1, 1924, as shown on page 8. These general account rates were not revised again until January 1, 1928, as shown on pages 5 and 6 of the exhibit, but during that interval the general equipment rates were revised as of January 1, 1926, as shown on page 7. Subsequent to January 1, 1928, new rates were determined as of the beginning of each year, January 1, 1929, as shown on pages 3 and 4, and January 1, 1930, as shown on pages 1 and 2. In other words, the way this set of tables is arranged is that the rates continued in effect from the effective date shown on the tables until the next effective date, working in reverse order through the exhibit.

2387 I have two sheets headed "Illinois Bell Telephone Company, Annual Depreciation Rates, Chicago Area, January 1, 1931" (which said sheets were marked for identification as Plaintiff's Exhibit A-126).

This exhibit shows the rates made effective January 1, 1931, and is similar to the sheets contained in Exhibit A-125.

The exhibit marked for identification as Plaintiff's Exhibit 127 shows the annual expense of depreciation which has been charged in the records of the company for each of the years 1923 to 1931, inclusive, together with the related investment on two bases, first, the total investment in plant and office furniture and fixtures, excluding land and right of way; and second, the average investment in depreciable property only, that is, property requiring depreciation accounting.

2388 This expense shown on Exhibit A-127 is the result of the application of the rates which I have referred to in the previous exhibit to the average investment in property in each of the years under consideration. That application is made by the Accounting Department of the company. The amount of depreciation expense annually is computed on the basis of the rates shown in Exhibits A-125 and A-126; those rates being applied to the dollar amounts of the corresponding plant accounts. The dollars appearing in the second column

of Exhibit A-127 are the actual charges for expense of depreciation made by the company during each of the years.

The purpose of this exhibit (A-127) was to show the percentage relation of the annual depreciation expense in
2389 each year to the average investment. This is done in two ways. For management comparisons, the first method that I have shown is usually employed, that is, we simply relate the depreciation expense to the total investment, excluding land and right of way. For engineering purposes, however, we usually confine the investment to that investment which is associated with property for which the depreciation expense is set out, and in order to clarify that point and have a correct understanding of just what we are speaking of, I have set it up in both ways, so that we can make reference to either one, and understand of what we speak in that respect. These percentages, by the way, are usually referred to as composite rates of depreciation.

The term "composite rates" may be a little confusing, because we employ it both for separate accounts and for the property as a whole. The composite rate is simply a weighted rate of two or more other rates. In the case of accounts like "Buildings," that have several rates, we determine a composite rate for that account which will automatically set
2390 up the expense associated with all classes of buildings, involving several different kinds of rates. In connection with the composite rates for the entire property, such as this Exhibit A-127 refers to, that simply means the composite rate derived from the total expense which has previously been determined by individual rates for separate classes of property, related to the total investment on either of these two bases that I have described.

The dollar amounts appearing on Exhibit A-127 have been taken from the books of the company.

An examination of the composite rates shown on this Exhibit A-127 would not disclose the trend of the individual rates, due to the fact that these composite rates are influenced not alone by changes in the component rates, but also by changes in the relative investment. That is, if the investment

in a class of property having a higher rate than the average should increase in greater proportion than the other items, it would naturally have the effect of increasing the com-
2391 posite rate. An indication of what has happened to the rates without the influence of the changing investment can be determined, however, by applying the component rates for each year to a common base or a common investment, and doing this has indicated that the rates have been the same in their composite effect for this entire period with the exception of the year 1923, at which time the rates were higher. I have, for example, applied the class rates, or the component rates of each of these years 1923 to 1931, inclusive, to the investment in each class or sub-class of property as of December 31, 1929 (this is on the engineering basis of depreciable property only), with the result that the composite rate for the year 1923 was 5.6 per cent, and for all subsequent years, 5.2 per cent. It should be kept in mind that the rates I am speaking of are comparable with the last column to the right on this exhibit. That comparison which I have just stated is one which shows the trend, whereas, the composite rates shown on Exhibit A-127 may vary from year to year solely on account of
2392 the different weightings of different elements of plant, even assuming that the actual depreciation rates have remained the same throughout.

The folder having the legend on the cover page "Illinois Bell Telephone Company, Chicago Area, January 1, 1930, Depreciation Study, Life and Salvage Data", and containing thirty-six pages of charts and computations, followed by a separate section consisting of fourteen pages of text, was prepared by me or under my direction (which said folder was marked for identification as Plaintiff's Exhibit A-128).

The purpose of this exhibit (A-128) was to illustrate rather fully the methods employed in studying life and salvage experience of the past, in arriving at conclusions. We selected for this purpose what happened to be the latest study at the time, that is, the 1930 depreciation rate study, and used
2393 that for descriptive purposes in this exhibit. There are twenty-three classes of property in the Chicago area for

which it is necessary to develop annual rates of depreciation. These different classes of property have rather greatly varying physical and functional characteristics that make it necessary to employ different methods of studying life and salvage. All of the classes of depreciable property in Chicago are listed on page 1 of Exhibit A-128 by their descriptive titles, arranged in the first column in accordance with the customary listing in accounting reports, and rearranged in the second column into four groups which accord with the methods employed in considering life. The next two columns on page 1 show the importance of each class of property as indicated by the relative investment and relative annual depreciation expense associated with each of those classes. It may be of interest to note that Group 1, which consists of just two accounts, has an investment in excess of 41 per cent of the total investment in all depreciable property, and an annual depreciation expense of more than 47 per cent of the total depreciation
expense in Chicago. The similar facts for the subse-
2394 quent groups are shown also on the same page.

Page 2 was prepared to give some idea of the growth that has occurred in Chicago in stations, lines and investment. It was thought that it would be of interest, in view of the fact that growth is probably the chief cause of retiring telephone property. The chart at the left on page 2 shows the actual growth in stations, lines and investment, while the chart at the right offers the same information as a percentage of the amounts in 1914. The right hand chart, therefore, probably gives a better idea of the rate of growth in recent years for these three items. The lines have increased from
150,000 in 1914 to 460,000 at the end of 1930. I am using round figures as I cannot read the charts very closely, but
that is approximately the extremes. The investment
2395 has increased from about $45,000,000 to $195,000,000.
The stations have increased from 400,000 to 1,020,000 at the end of 1930.

The fact that the investment has increased faster than the stations and lines have increased is due to several causes. One of the inherent causes in the telephone business is that

as the business grows and as the stations and activity in operation grows, the amount of property increases. That is a fundamental characteristic of the business, and that, of course, brings an increasing investment per station in itself, unless it is offset by developments or economies, or some other means of overcoming that fundamental increase in cost. Another thing that has occurred during this period is the great upward shift of cost levels which have affected not only the additions and extensions to our property, but replacements as well, that is, removal of cheaper plant and its replacement by more expensive plant. There is also some effect in here of the greater first cost of dial equipment and apparatus. Furthermore, during this period there has been
2396 a demand for better classes of service, which has been evidenced, at least in part, by regrading of lines from four party and two party to single lines, and an increasing number of trunks serving private branch exchanges. That is shown on the graph here by the fact that the lines have increased faster than the stations.

May 13, 1932.

2398 A comprehensive discussion of the methods of arriving at life and salvage, and the basis for conclusions, for all of the numerous classes of property that are involved in depreciation accounting, would require considerable time, and in view of the fact that many of the classes of property have a negligible influence in the total depreciation expense, I have selected the principal accounts, of which there are seven, for explanation, and have included them in this exhibit. These seven accounts which are shown on page 3 have been selected due to their predominance in the investment and in the annual depreciation expense. It will be noted on page 3 that the combined investment in the seven accounts is in excess of 91 per cent of the total investment in all depreciable property, and also the annual depreciation expense for these seven accounts is in excess of 91 per cent of the total annual depreciation expense. In other words, the total investment in all

other accounts, of which there are sixteen, amounts to less
than 9 per cent of the total investment, and the depreciation
2399 expense for all sixteen accounts is less than 9 per
cent of the total depreciation expense.

As I further explain the subsequent pages of the exhibit, the basis upon which I have divided these seven principal accounts into four groups as sheet 3 shows I have done, will be made to appear.

On page 4 I have indicated the two general classes of property that are included in Group 1, together with the segregations, or sub-classes of property within each of those accounts. I have also shown on this page the relative investment in each sub-class of property, the estimated average service life, the expected average net salvage, and the resulting annual rate of depreciation for each sub-class of property.

There is also shown on the page the composite annual rate of depreciation applicable to the total investment in each of the two accounts. The Central Office Telephone Equipment composite rate is 6.8 per cent, while that for buildings is 2.8 per cent.

These two main classes comprising Group 1, that is, Central-
Office Telephone Equipment and Buildings, are grouped
2400 together here because of the methods employed and the
procedure followed in arriving at the service life and salvage, and deriving the depreciation rates applicable to those classes. They are also grouped because of the fundamental similarity of the life characteristics of those two general classes of property as they differ from most other property.

These two main classes of property in Group 1 comprise a little more than 41 per cent of the entire investment of the company in Chicago in depreciable property.

The procedure which we have followed in studying the life of the property included in Group 1 is illustrated by the computations shown on page 5 of the exhibit. This statement shows the methods employed in computing the average life of the manual equipment at Kedzie central office. The same procedure has been followed for equipment in all other offices

in the city. The initial equipment, that is the first in-
2401 stallation, was made in Kedzie office in 1906. I am now dealing with the actual history and the actual facts applicable to the Kedzie office. This statement, of course, covers both the actual facts as disclosed to the latest available date and our estimate as to the future. The exhibit necessarily is projected to the year 1936 as, according to our engineering forecasts, the Kedzie office will be retired in 1936.

2402 The life characteristics of most of the telephone properties differ somewhat, or differ largely, I might say, from those of the property contained in Group 1. Most of the items of telephone property are placed and retired as individual units of property. In the case of the property contained in Group 1, however, this property is built up by an initial installation and a series of subsequent additions; and then all of the equipment, or building, is retired simul-
2403 taneously, except for relatively small retirements that occur during the over-all period.

In that connection, it is important to keep in mind the fact that each subsequent addition to the initial construction or installation has a composite shortening effect upon the average life of the property as compared to the over-all life. An illustration of that would be in the case of central office equipment, where we might start with an office, let us say, having perhaps an "A" board, that is, an originating board, of twelve positions, or twelve operators, and a trunk board, or, as we term it, a "B" board, of, say, six operators. As the business in that district grows, and the number of stations increases, the amount of equipment required per new station added is progressively larger; that is due to the fact that the ability to connect with each subscriber's line must be made available to every operator. In the case of six operators, there only need be enough appearances on that line so that the six operators, or any one of them, can make connection with the line. When that board has increased, let us say, to twenty-six operators, the equipment must be repeated, or, as we say, multipled, sufficiently to make every line available to

2404 every operator. Furthermore, the lines that were available to the six operators originally must also be extended, so that you have the double influence of not only making new lines available to a large number of operators, but increasing the availability of the existing lines. For that reason the additions grow progressively larger, for a given amount of new business, and, of course, result in increasing costs for later additions.

As the additions are made, the life of such additions is consequently shorter than previous additions, because the entire equipment is limited to the time of complete retirement of the office. For example, take the Kedzie office again; the initial equipment, or that portion of the initial equipment installed in 1906, which will survive to the time that the office is retired, which we estimate to be 1936, would be 30 years old. Additions, however, placed in 1926 would be only 10 years old at the time of retirement. So that you actually have in this type of property a composite life of all the various lives of the different additions that are made throughout the over-all experience of the office.

2405 On page 5 I have shown the various additions, retirements, and amounts of equipment in service for each year, and other information for analyzing life to the latest available date of actual experience, which is the end of 1929 (the point where the horizontal line crosses the sheet), and, in addition to that, the further additions and retirements down to the expected date of complete retirement, which is based on engineering forecasts. From this information the dollar years of service life are computed, and shown in column 5, which, when divided by the cost of equipment shown in column 6, results in the average life of the equipment at any given age of the office. The figures shown in the last line of column 7 indicate that an average life of 12.6 years is expected at time of retirement, which is 30 years after the initial installation (the final figure in column 8). Column 8 merely proceeds in numerical order throughout the years 1906 to 1936.

On page 6 there is shown the results of the application of

the method described on page 5 for the Kedzie office to each of the offices in the Chicago area.

2406 Page 6 shows the actual year in which the initial equipment was installed, and the estimated year of final retirement. It is our view that the change from manual to dial service in Chicago may reasonably be expected by 1945, and my estimates of the average lives for each of these offices are based upon a program predicated upon that view. The average life of the manual central office equipment in each office to the time of retirement is shown in column 1. This has been composited on the basis of the investment at the end of 1929, resulting in an average life for all manual equipment in Chicago of approximately 11.7 years, which is the last figure in column 1, on page 6.

I have not incorporated in this exhibit, or in any of the exhibits which we intend to offer in connection with my testimony, a study for each of these offices corresponding to

2407 the study for the Kedzie office shown on page 5. Those studies are in my office, in the original form (I believe pencil work sheets), and have been made available to the City of Chicago for examination. They were made available at the time this exhibit and the other exhibits that have been and will be identified were delivered to the other side the first of last August.

This study was the basis of my conclusions as to the average service life for manual central office equipment in Chicago.

This study was made in 1929, before we had knowledge of the effect of the business depression, although in 1930 when I arrived at my conclusions, I realized that we might expect a very severe reaction on certain types of plant. In view of that situation, I made some tentative studies of what certain deferments might result in, in the way of average life, and concluded that thirteen years would adequately provide for such deferments as we might expect under rather severe busi-

2408 ness depression conditions. I have used thirteen years in the rates, although the computations indicated 11.7 years. The result of using the greater number of years was, of course, to reduce the depreciation expense rate and,

therefore, to reduce the charges to expense on account of depreciation.

By deferments I mean two things that might happen; one is that we might defer the final retirement dates of the offices as we now have them programmed; and the other is that we might defer not only those final dates of retirement but all additions expected in the earlier years. Of course, there is a possibility that a condition of this kind might result in a shorter life. I do not think it will in this case, but if the final retirement dates are not deferred, but the additions are, the result would be a shorter life than that which we had computed in 1929. I do not anticipate that situation.

Having determined the average service life for units 2409 of manual central office equipment, it is then necessary, in order to derive the depreciation rate applicable, to make a similar determination of the expected salvage to be recovered upon retirement. Page 7 of this exhibit (A-128) takes up that subject matter.

Page 7 shows in graphic form the actual salvage experience for manual central office telephone equipment from 1914 to 1929, inclusive, both for complete office retirements, and piecemeal retirements. The latter are relatively small, being associated with additions and rearrangements of the existing equipment, and probably represent, according to some of my studies, about 6 per cent of the total equipment retirements over the entire life of the office. The upper chart on page 7 shows gross salvage obtained; the center chart, the cost of removal; and the lower chart, the net salvage (gross salvage less the cost of removal). All of these charts have the 2410 salvage and costs of removal expressed as a percentage of the original cost of the retired property.

In general during recent years the net salvage on the average has approximated 10 per cent. The high salvage that is shown for the year 1929 is not significant, as it involves an acounting adjustment of a carryover from 1929 to 1930. The salvage experience in 1929 was 30 per cent net salvage, while in 1930 the salvage was 50 per cent negative; and it is necessary to combine the two years to get the true salvage.

I have done that, and found that the salvage for both 1929 and 1930 combined, was 14 per cent. The net salvage for complete office retirements, according to our examination of completion reports of recent years, ranged from 5 per cent to 12 per cent for individual offices. In the past, of course, partial re-use of central office equipment has been reflected in the net salvage figures, and in view of the expected complete elimination of the manual equipment, we naturally cannot expect quite so favorable salvage conditions in the future. In spite of that, however, I have used in the depreciation rates an average net salvage of 10 per cent, which I think is the maximum that we can possibly anticipate for the future.

2411 Turning back to page 4 of the exhibit, in order to keep in mind the plan and arrangement of the exhibit, I have now explained how I found the life of thirteen years for manual central office equipment, and 10 per cent for salvage, resulting in the depreciation rate of 6.9 per cent, as shown on page 4. The next sub-class of Central Office Equipment is Dial.

Our experience with panel-type dial equipment has been limited to the period subsequent to 1923, at which time we installed our first office. Therefore, we have not enough
2412 past history available to offer a significant life analysis.

It occurred to me that the best method of approach in estimating the life of dial equipment was to compare it with the experience of the manual equipment and make allowances for such differences as we could see. There are several factors that should produce a longer life for dial equipment than has been experienced for manual equipment. In the first place, the initial installations, which, of course, have the longest life in the composite effect, are expected to be relatively larger in the case of dial than they have been in manual installations. We also anticipate a longer life for dial buildings than we expect for manual buildings. That, in turn, should produce a longer life for the dial equipment than for the manual.

The life experience that we have analyzed for manual equipment has been influenced to some extent by changing cost levels, wherein the later additions, which are, of course,

of shorter life than the earlier additions, have somewhat greater weight in the composite effect, due to having been more costly per item of property installed. The net effect of

that has been to reflect a shorter life than would have
2413 been experienced had costs, for example, remained uniform. We do not expect cost levels to operate in the same direction in the future, that is, as far as we can foresee it, and we think due allowance should be made for this difference, which will result, if our predictions are true, in a longer life for dial than for manual.

We have attempted to keep in mind, also, factors which may produce a somewhat shorter life relatively in dial than in manual experience. One of these is the possibility of change in equipment design, due to the newness of the panel-type equipment, which may result in economical replacements at some future time.

Another factor that we have considered is that improvements in manual offices have been brought about through changes in operating practices, whereas similar improvements in dial offices must come, at least to some extent, through changes in equipment.

After consideration of these factors, and in view of the influence of the shorter-lived later additions over perhaps a rather long period of office life, I have estimated that the dial equipment will experience an average life not in excess of eighteen years. I have used eighteen years in the rates.

2414 In view of this longer life that we are anticipating for dial equipment, as compared to manual, and keeping in mind the possibilities of the supercession of existing equipment which may affect possible re-use after removal, I have concluded that we may expect a relatively low net salvage for this equipment upon retirement, and have estimated the net salvage at 5 per cent.

The third sub-class of Central Office Equipment is Toll. We have in Chicago two general types of toll central office equipment; first, the switchboard equipment at which connections are made to toll lines, and second, the types of equipment that are associated with the lines, those designated by

us as toll line equipment, consisting of such items as repeaters, carrier current equipment, Morse telegraph equipment, and so forth.

Our present toll switchboard, which is located in the Bell Building at 212 West Washington Street, was installed in 1929, so that we have very little experience with that particular group of equipment. However, we have available the actual experience of the two former toll offices, which contained somewhat similar switchboard equipment. This, because of the fact that the present equipment contains about the same amount of long-haul and short-haul service facilities as those former offices in their combined effect, should give us a very good indication of what we may expect in regard to the present equipment life.

This experience is shown on page 8 of the exhibit. The upper left-hand table is that of the former toll office used in Long Lines service. The table to the right of that shows the life experience of the other toll office, which was used for short-haul business. The combined experience of all this former equipment, as shown on page 8, resulted in an average life of about 7.5 years upon retirement, although one of the offices was in service 21 years, and the other in the neighborhood of 18 years.

Based on this previous experience, and keeping in mind the possibility of some shortening effects on the present equipment life, due to possible decentralization of toll operations in Chicago, and also possible replacement, or partial replacement of existing manual equipment with dial, I have estimated an average life of eight years for the switchboard equipment in the present toll office.

The lower left hand table on page 8 shows our actual experience, to the latest date available, for the toll line equipment at Morrell Park, which has resulted in an average service life of 5.6 years at the end of 17 years' office experience. The lower right-hand table shows that the average life of the equipment in the Franklin Building was 2.6 years at the end of 7 years over-all experience. The shorter average life relative to over-all age in the Franklin Building is due to the more

rapid growth of the equipment in that office, which is expected to continue in the future.

From this experience, which is largely based upon that of the Morrell Park office, it would appear that an average life of not to exceed eight years may be expected for toll line equipment.

The actual net salvage obtained upon the retirement of the two former toll offices is available in the records of the company, and has been analyzed, and results in a net salvage of approximately 25 per cent of the original cost of the
2417 retired property. This retirement, however, occurred under very favorable conditions. That is, a very large amount of the retired equipment was incorporated in the new toll office, and it also occurred at a time when there was a very large demand for that type of equipment on the part of other companies, and we made a number of rather favorable sales. We do not anticipate quite such favorable conditions from both of these sources at the time of retiring the present equipment, and for that reason I have modified the actual salvage experience somewhat as an estimate of what we may expect in the case of the present office. On that basis I have estimated an average net salvage of 20 per cent for the toll switchboard equipment in the present office.

In the case of our actual experience with toll line equipment salvage, we have actually had very little experience with this type of equipment. I think, however, that our retirements in the years 1929 and 1930 in Chicago might be considered fairly representative of what we may expect on the average upon the retirement of this equipment. The average net salvage for those two years, as actually shown on the books of the company, was 18 per cent of the original
2418 cost of the retired equipment. I have investigated some of the retirements which we have made outside of Chicago in order to get as broad a picture of the situation as possible. I found that the rather meager experience there resulted in actually obtaining a net salvage approximating 15 per cent of the original cost of the retired equipment.

I have made some computations that would indicate that

under the most favorable conditions, where the materials are very largely re-used, we might expect as much as 40 per cent, and as little as possibly 4 per cent—that is where we junk the equipment.

In view of all these investigations I have come to the conclusion that an average net salvage of 20 per cent for toll line equipment would be a reasonable expectation. A life of eight years, and a salvage of 20 per cent, gives the 10 per cent rate for toll central office equipment.

Page 4 of the exhibit shows that the composite for the three sub-classes of Central Office Equipment is 6.8 per cent, and I have already explained how that is derived.

2419 "Q. Am I right, Mr. Turner, in my understanding that under the accounting rules of the Interstate Commerce Commission, and of the Illinois Commission—which I believe are identical with those of the Interstate Commerce Commission—the actual charge to expense, the dollar charge, is determined by applying the composite rate of 6.8 per cent to the total main account of Central Office Telephone Equipment, rather than by applying the specific rates for Manual Dial and Toll, to each of the sub-classes.

"A. That is my understanding, except that I believe the accountants take one-twelfth of the annual rate and apply it to the monthly investment."

2421 "Mr. Goldstein: Is it that the bookkeeping figure is determined, or the expense in dollars; which is it?

"The Witness: In my opinion it is both.

"Mr. Adcock: We move to strike out the answer because it is not within the province of the witness to determine what the statute requires and it is simply a conclusion.

"Judge Wilkerson: So far as that is concerned, it may be that this type of testimony should be disregarded, because if it is a matter of interpretation of the statute, it be-

2422 comes a matter for the court to determine. If the witness has put anything into the record here under an erroneous interpretation of the statute, the court, of course, will disregard it."

The second main class of property included in Group 2 is

Buildings, and the first sub-class, specifically Manual Central Office Buildings.

The life experience of manual central office buildings has been studied in a manner similar to that which I have previously described for central office telephone equipment. On page 9 I show the results of these studies. The buildings shown in the first column, that is in column A, are separated, those in the upper group being the buildings that we expect to dispose of at the time of changing from manual to dial equipment; and those buildings shown in the lower group being those which we expect to incorporate in the new projects and continue in service. As this statement is similar to the one that I have already described for central office equipment on page 7, it is only necessary to call attention to the results shown in column I. The upper group of buildings are estimated to have an average life of 18.1 years. The buildings in the lower group are estimated to have an
2423 average life of 36.6 years; while the average of all buildings of this type is 21.5 years.

As in the case of central office equipment, I gave some consideration to the effect of the business depression upon the possible life of these buildings, and estimated an average life of 25 years for all buildings in this group. That differential between 25 years and the 21.5 years found by this study, I think is a liberal allowance for reasonable expectation of deferments.

2424 I could not say definitely that the relative size of the initial installations for manual central office buildings are similar to those of manual central office equipment, but the buildings do have the same life characteristics as central office equipment in that in almost every building that we have, we have started, as we economically should do, with a building only large enough to take care of a certain number of years of growth, and we have added to that building by placing either additional stories or lateral additions. That has invariably been our procedure in the past and we expect the same condition for the future. We could not economically build the ultimate building required at a given location. It

would result in an enormous amount of idle space, or the alternative of having others renting space from us in a building upon which we have very severe restrictions as to fire hazard, access and so forth. The effect of that factor
2425 will appear from the statistics given in the exhibit on page 9.

In determining salvage for these buildings we have investigated, in the first place the salvage that we have actually obtained in the past for buildings which we have sold, and, of course, we have recognized any buildings that may have been wrecked. This past experience that we have had is not particularly comparable, however, with what we may expect, due to the difference in the size of the buildings, and their general layout or design. The past salvage has been extremely small, but that is to be expected for a telephone building that is sold for other purposes. In the first place, the building is decidedly overbuilt as to floor loads, for, let us say, apartment use, or residential use. It also has very high ceilings and many other features that are not desirable to a prospective purchaser. Many of our buildings are located in districts that are zoned for apartment or residential purposes, where the re-use of the building would be extremely limited, and I think probably quite undesirable.

2426 I have made studies of the possible salvage that we might obtain through sales, by grouping the buildings in accordance with their attractiveness and possibility of sales. For example, I have grouped the buildings in more favorable commercial areas, where we think the prospects are best for disposal. I have placed others in a group that would be in commercial areas where the type of surrounding structures would indicate very little salvage and a great deal of difficulty in the sale of the buildings. Then further groupings have been made of apartment districts, districts zoned for apartments and residential districts.

I have arrived at what I think to be a fair sale value for each of the groups of buildings. This amount of money resulting from that computation has been assigned to the individual buildings for the purpose of determining the relation

of that amount as compared to the original cost of the building at the time of retirement, which furnishes the net salvage percentage that we seek. That is shown on page 9 of the exhibit, in column L, that is, the net salvage assigned to each of these buildings. The composite or average net salvage for all of the buildings as shown at the bottom of column L, is 17.8 per cent.

2427 I have rounded that out for use in depreciation rates and used 20 per cent average net salvage, which I think is the maximum that we can possibly expect from these buildings. That salvage, of course, includes buildings which are definitely scheduled to be wrecked to make way for other telephone buildings on the same site.

A life of 25 years and a salvage of 20 per cent gives the rate of 3.2 per cent for this class of buildings.

Like dial equipment, we really have had insufficient experience with dial buildings to analyze past life experience, and again I have relied to some extent upon comparisons with the experience expected from manual buildings. I have come to the conclusion that we may expect a substantially longer over-all life for dial buildings. I think that would be the result of modern engineering and would make due allowance for perhaps more additions than has been the case in the past.

The foundations would be designed to take perhaps more
2428 stories than we have previously allowed for, and the general design of the building I think will offer greater flexibility for replacement of equipment; all of this will make for a longer over-all life of the buildings.

Our experience with manual buildings has resulted in an average over-all life of slightly more than 30 years and I think it reasonable to expect as much as 50 years on the average for the dial buildings. When I say "over-all life" I mean from the beginning of the initial structure to the time of the disposal of the complete structure. The effect of the shorter lived additions, however, reduces the average life experience by reflecting the lives of the various increments that are made to the building. On the basis of a typical dial building as we see it today, the average life resulting from the use of an

over-all life of 50 years would approximate 30 years. The Franklin Building, which is a dial building, however, is not susceptible of any further expansion, as far as I can ascertain, which is contrary to the usual case in connection with a typical operating building. The Franklin Building was 2429 originally 11 stories, and has been increased to 18 stories.

It is my understanding that the foundations will not support any further additions and that we are restricted from making lateral additions. In view of this elimination of the effect of later additions, the average life of that building based on a 50-year over-all life, would be 40 years rather than 30. Weighting this average life of the Franklin Building, with the average life expected for all other dial buildings in Chicago (30 years) on the basis of the relative investment, results in an average life for all dial buildings of 35 years, which has been used in depreciation rates.

Although the buildings are expected to have a longer life, and will therefore be older at the time of disposal, I have estimated the same net salvage for dial buildings that I have used for manual buildings, that is, 20 per cent. I did this because I think a larger percentage of these buildings will be located more favorably with reference to commercial streets or areas. There are also certain parts of the design of the building more attractive to commercial purchasers; one of these is that the first floor is placed at street level, whereas in most of our existing buildings the first floor is several 2430 feet above the level of the street. The average realized life of the dial buildings in relation to their over-all life from first to last is substantially greater than has been true and is true of the manual central office buildings.

The next sub-class of buildings shown on page 4 of this exhibit (A-128) is the General Office Building. Because of its character, it has to be treated upon its own peculiar considerations.

We have only the one building (that known as the Bell Building at 212 West Washington Street) of that general type and no predecessors. To arrive at the depreciation rate, it was necessary for us to investigate the life experience of

other commercial buildings that might be available. Such an
investigation of as nearly comparable buildings as pos-
2431 sible in Chicago indicated an average over-all life of
about 40 years, but in view of the fact that the Bell
Building was constructed some 20 years later than the build-
ings investigated, I felt that with a more modern design we
might expect a longer over-all life, which I estimated at 50
years. Of course the investment in a building of that type,
or any other type I presume, is made up not alone of the
structure, which has a relatively long life, but of various items
of building equipment, such as plumbing and heating, ele-
vators, electrical equipment and so forth, which has a rela-
tively shorter life. The fixed and movable equipment in the
Bell Building represents about one-fourth of the total invest-
ment in that building. I have estimated an average life of
30 years for the building equipment, which I think is a very
liberal estimate compared to some that I have seen by other
concerns which are interested in these matters. With
2432 an estimated structural or over-all life of 50 years for
the building, and an average life of 30 years for the
equipment in the building, the composite average life would
be 40 years. That is what I used in deriving the rate.

As to the salvage for the Bell Building, there are no defi-
nite plans at all that I can ascertain for the ultimate disposal
of that building. It is the engineering view that when the
building has served its purpose we will probably remove it
and place a new building on the present site, a building of a
somewhat different design. On that expectation I have con-
sidered that the building will be wrecked. Investigations of
the wrecking of buildings around in the loop, such as I could
obtain, indicated that the cost of removing a building was in
excess of the gross salvage obtainable from the recovered ma-
terials. However, having rather indefinite information on
that subject, I assumed that the materials recovered would
pay for the cost of removal, and have used zero net salvage.

Forty years life and zero salvage gives the depre-
2433 ciation rate of 2.5 per cent on that building.

The three classes of buildings which I have now discussed, that is, Manual Central Office, Dial Central Office and the General Office Buildings represent approximately 97 per cent of the total investment in the building account. Page 4 of the exhibit (A-128) shows the percentage of total investment in depreciable property in Chicago for each of those three classes. The remaining three per cent is made up of one garage and warehouse that we have and the investments for improvements we have made in quarters which we rent.

In determining the depreciation rate for garages and
2434 warehouses, I have used an average life of 25 years and an average net salvage of 15 per cent, resulting in an annual rate of 3.4 per cent. For improvements to rented quarters I used an average of 25 years and zero net salvage, resulting in a rate of 4 per cent.

The composite depreciation rate applicable to the entire building account is 2.8 per cent.

The segregation of the property into Group 1 includes only two accounts, both of which are covered by this exhibit (A-128) as distinguished from the other groups, wherein perhaps only a few accounts are furnished in this exhibit as examples. In other words, I have covered everything in Group 1 in this exhibit. That means that I have covered 41 per cent of the investment in Chicago in depreciable property, and 47 per cent of the total expense of depreciation.

2435 The several classes of property which have been included in Group 2 are shown on page 10 (A-128). The investment in property in this group is represented principally by just three accounts, which are shown above the horizontal line drawn across the page. These are: Private Branch Exchanges, Exchange Aerial Cable, and Exchange Underground Cable. The total property in this group has a combined investment of about one-third of the total investment in depreciable property. Of the property in this group the three accounts which I shall discuss have a combined investment of approximately 93 per cent. It is, therefore, my intention to confine my explanation of the methods of studying the life and salvage, and our conclusions, to these three

accounts. As I said before, the three accounts are 93 per cent of the total of the accounts in this group and represent 30 per cent of the total investment in Chicago in depreciable property. They account for between 25 per cent and 26 per cent of the total depreciation expense. That is what we are dealing with now when I take up this branch of my testimony.

2436 Here again the grouping of these classes of property into Group 2 is based upon the fact that similar methods of ascertaining the lives have been employed. That is generally true. Of course there is one exception to that, which I will describe a little later.

The various classes of property contained in Group 2, with the one exception which I shall describe a little later, consist of numerous individual units of property, which are placed and retired as individual units. We are therefore able to analyze life by determining the average experience of large groups of such units. Our methods that are employed in this analysis are known as mortality studies, and are very similar to the methods employed by insurance companies in the analysis of human mortality experience. The data re-

2437 quired for the analysis of human life is the number of persons at each age who survive until the following year. From that sort of information, which is determined for all ages, survival rates are computed and these survival rates in turn are translated into what are termed life tables. A graphic description of a life table is shown on page 11. This is known as the American Experience Table for Human Lives. The heavy curve starting at the upper left hand corner of the page and descending diagonally to the lower right hand corner, shows the percentage of an original group of persons starting at age 10 who survive to each subsequent year of age. The lower curve (which we term a mortality curve) shows the percentage of the original group of persons starting at age 10 who die in each year of age subsequent to age 10.

For example, if you wish to ascertain the percentage of an original group of persons starting at age 10, who will survive at age 50, you will find the figure 50 at the bottom of

the page, and following the vertical line upward until it intersects the life curve, it may be noted that this occurs at the horizontal line, which at the left of the page shows the figure 70. That means that 70 per cent of the original group 2438 survive at age 50. The lower curve shows that of the original group of persons starting at age 10, approximately three fourths of one per cent die in each year of age up to about age 40, as indicated by the readings at the right of the chart. After age 40 the percentage dying in each year increases rapidly, reaching the maximum of about 2.6 per cent dying at age 75.

This mortality curve for human lives such as used by life insurance companies is presented here merely as illustrative of the mathematical processes that are employed.

The data required for these studies as applicable to the telephone property are the placing dates and retirement dates of all retired property as far back as our experience is available, and the placing dates of all surviving property. In order to obtain this information the company has established what is known as a mortality routine that currently provides the necessary information.

2439 This data originates in the plant department of the company, where a direct contact with the placing and removal of the property occurs. It is then submitted to the Accounting Department for reconciliation with disbursement and recovery records and finally sent to the Engineering Department for use in the mortality studies. Before using the data the Engineering Department prices the various items in each sub-class of property at uniform costs in order to properly weight them together and thereby reflect the life experience on a basis comparable to the investment to which the rates are applied.

I think the simplest way to explain the necessity for reducing these to a uniform price level is to take the case of cable, for example. One cable costing $2 a foot has a certain life, another cable included in this same grouping, costing one dollar a foot, has a different life. Now, it is necessary for us to give twice as much weighting to the $2 cable as the one

dollar cable, in order that the dollar years of life, which is in
the final analysis what we seek, may be properly ascer-
2440 tained through a correct method of weighting.

The data that is summarized, as I have just described, is shown on page 12 in the form of a summary statement, which in this case happens to be an actual copy of a work sheet for non-multiple private branch exchanges. This statement shows the amount of this type of property that was placed in each year, the amount surviving, and the amount retired in each subsequent year. From information of that character, as I explained in the case of human mortality, survival rates may be readily computed for individual years and an average life determined. However, if we analyze the experience of individual years, for example, the year of 1898, it would be of little significance in drawing conclusions for the life of the present property. This is because conditions change, that is, factors controlling life change over so long a period, so it is desirable to make the life analysis on as recent a basis as possible. This can be accomplished by analyzing the information shown in the lower rectangle of each of these
columns, which are the years subsequent to the year of
2441 placing. The lowest rectangle in each column represents
the experience in the year 1928 for property which was placed in all previous years. From that information we can determine for the experience of 1928 what the survival rates are at each age of the property. We have felt that it is advisable to include in our analysis more than one year, because of temporary conditions that may occur in individual years, and also to secure a greater volume of data in the study. For that reason we combine three years into a group, or band, as we call it, for purposes of analysis. For example, on page 12 we show the band of years which has been analyzed to determine average life covering the years 1926, 1927, and 1928, the experience for which is shown below the heavy jagged line extending diagonally upward from left to right. From that information below the heavy line we have computed the life table which is shown on page 13. In order to avoid the use of decimals, which would be required if we

expressed the life table as a percentage, we use a starting point of 100,000 units, so that the surviving portion of all classes of plant is expressed in relation to an original group of 100,000. On page 13 the average life to be derived from this life table may be readily computed by summing up
2442 the number of units remaining at each age, and dividing that total by the 100,000 units exposed to this experience. That results in an average life as shown on the chart of 6.6 years.

I am dealing here with actual historical data of the company, and this is not a theoretical but an actual curve.

Although many of the life tables from the present available data are not complete, that is, they do not cover a sufficiently long period to completely exhaust the amount of property under consideration, there is a method available for extending these life tables to express a complete retirement of the original group of property. This process, which not only completes the life table, but smooths it to offer more representative experience, or, in other words, eliminates individual yearly fluctuations in order to get a more representative basis, is known as the graduation of observed data. The mathematical formula which accomplishes this purpose is known as the Gompertz-Makeham formula, and has been carefully investigated, tested and approved, and submitted to us by the American Telephone & Telegraph Company for use in our work.

2443 Page 14 (Exhibit A-128) shows comparisons of life tables which have been computed from observed, or actual data, and those which have been graduated to represent the complete experience of the non-multiple private branch exchanges for four bands of years, as noted on the charts. The curves shown as dotted lines represent the life tables resulting from the observed, or actual data, while the heavy solid lines show the life tables resulting from the graduation of the actual data. The average life shown on each of the four charts was computed from the graduated data.

Page 15 shows one of the tests which we have made here in Chicago of the application of the formula to incomplete

observed data. Chart A is based on an analysis of experience covering twenty-four and a half years, during which 75 per cent of the original plant was retired. The graduation of this experience resulted in an average life of 16.7 years. Various assumptions as to eliminating parts of the actual experience were made and graduated life tables computed through the gradual stages shown by the several charts on page 15 down to the most extreme assumption which was predicated upon the assumption that only fourteen and
2444 a half years of experience was obtainable for this plant and that only 45 per cent of the original group had been retired. The result of the computation of average life from this graduated life table was sixteen and one-half years, so that the variation between the two extremes was but two-tenths of a year in the final result.

The chart at the bottom of the page (Page 15—Exhibit A-128) shows the differences resulting from all six computations, and these differences are confined to an extreme of but four-tenths of one year, which approximates three per cent of the average life determined on the basis of the more complete experience, although we have a difference in the over-all period analyzed of ten years, that is, from fourteen and a half to twenty-four and a half years.

I said a moment ago that in the case of the lowest chart in the right hand column I made the assumption that I had an experience of fourteen and a half years. Another way of stating it would be to say that I took the actual experience which we did have covering fourteen and a half years and dealt with that experience in that table.

2445 I actually had an experience of from fourteen and a half to twenty-four and a half years, and have taken the experience of fourteen and a half years, sixteen and a half, eighteen and a half, twenty and a half, twenty-two and a half, and twenty-four and a half for the purpose of these studies. The conclusion from this study is this: that if we had had the experience of only fourteen and a half years, used in the lowest right hand table, and had applied the mathematical processes which I have described, we would have obtained the

average life of sixteen and a half years, which corresponds to the average life of 16.7 years indicated in the upper left hand table, where the experience covers the span from zero to
twenty-four and a half years; a difference of one-tenth
2446 of one per cent in the average life. In other words, with the shorter amount of available data, we would, for all practical purposes, have obtained approximately the same average life as we did with the more complete data.

While the mortality studies are based on the experience of our larger units of property in each classification, there are some items that should be reflected in the life conclusions which are not practically susceptible to mortality recording. These items are, for example, terminals associated with cable, cross arms associated with poles, and so forth. There is also some lag in the receipt of the mortality records due to the time required to report work finally completed and to the reconciliation processes that insure accuracy in the reports submitted to us. In order to care for both of those factors, we determine the retirement rates for the complete property in each classification by analyzing the experience shown by the books of the company. That is, we determine the relation of the dollars retired in a given year to the investment at the
beginning of that year. This provides information that
2447 may be compared with the retirement rate resulting from the information furnished through the mortality routine, and permits a means of adjusting the survival rates determined under the mortality study to conform with the complete plant experience as indicated by the records of the Accounting Department. These retirement rates which, as I said, are expressed as percentages of the investment at the beginning of each year, are shown on page 16 for the several classes of property in Group 2.

Page 17 shows the results of these studies of life for non-multiple private branch exchanges. In the upper chart on that page we show the computed average life in the form of dots placed at the center year of each three year band and connected together merely for the purpose of helping to indicate the trend that the average life has taken during this

2448 period. This study shows that in the earlier part of the experience, that is, prior to 1920, we were obtaining an average life of from seven to eight years for these non-multiple or smaller types of private branch exchanges which are located on subscribers' premises. The later experience has shown a downward trend of life, culminating in slightly less than six years, but approximating an average of six years for some period during recent experience. This tendency toward a shorter life in recent years is due, I think, to the replacement of many of our boards because of the introduction of dial operation and to the development of new types of private branch exchanges, of which there has been a number, both manual and dial types, and to a slight extent to the increasing use of centralized power plants, which have eliminated numerous small power plants in the larger buildings in Chicago. I think probably it is also due, to some extent, to increased moving of business firms as the result of the availability of larger modern buildings during recent years, and perhaps, in the last year or two they are moving back to cheaper quarters, which process may be expected to be reversed, perhaps, when business picks up again.

The substantial period during which the life indica-
2449 tions have stabilized around six years, and the prospects of continued factors affecting the life similar to those which have been recently experienced, indicates to my mind that we may safely use an average life of six years for our present equipment. So, notwithstanding the fact that the curve on page 17 shows less than six years, with a downward trend, I have used six years for the reasons stated. Of course, the longer the average life the lower the charge for depreciation.

We have just completed an analysis of the years 1928, 1929 and 1930, which we expect to consider in connection with the new 1932 rates which indicates an average life of five years. I don't think that I will let that influence my conclusions too greatly, however, because of the present conditions which I considered and hope to be of a temporary nature. In other words, we are having heavy retirements of certain items of

equipment which are controlled by public demand. Station apparatus and private branch exchanges are among
2450 them. I think that this severe loss in stations and switchboards should not be considered or given too much weight in considering the life of property over a long term of years in the future.

Page 18 shows the salvage experience for the only two years during which this experience was available separately for this particular class of property (non-multiple private branch exchanges). Prior to 1928 the records covered the combined experience of non-multiple and multiple switch boards. Page 18 shows in the upper chart the gross salvage, in the second, or center chart, the cost of removal, and in the lower chart the net salvage derived from the retirement of this type of property. This is shown by the solid lines. The dash lines show the salvage that would have been derived had the cost levels at the time of retirement been the same as at the time of installation. The latter basis of determining salvage for depreciation purposes, which look well into the future, is considered the most reliable means of predicating salvage
2451 on a basis that will conform with actual experience. It eliminates speculative predictions as to what we may expect during the long period of years over which the existing equipment will be retired. This procedure, that is, uniform pricing in connection with salvage, has been followed in considering the salvage experience of practically all other accounts contained in this exhibit. It eliminates the necessity of attempting to predict future price levels.

I might explain just how we retire these classes of property, and how I expect the current cost levels to affect both the original cost of the retired plant and the resulting salvage. In the first place, practically all of this property for which we consider the uniform price level in obtaining salvage is retired at average book costs, not at the original cost of the
2452 individual item, because there is no practical means of maintaining a record of such expenditures. The book cost is, of course, affected by changing price levels. When prices are rising, the effect of the units placed during that

period at higher costs will result in retiring items placed in earlier years at a greater cost than the original cost. In other words, on a rising price level, the property is undoubtedly retired at something in excess of its original cost, speaking of the individual units of property. That has the effect of making the book costs follow the current cost levels, and it is reasonable to expect that as costs increase and decrease, they will from time to time be above and below the average book cost at which the property is retired, and due to the fact that we have a constantly growing plant, if I may exclude the very recent experience and look forward again to a resumption of our normal progress, we have this increasing amount of new plant coming into our capital accounts each year, which quickly compensates for differences in the past between actual salvage and salvage at uniform price levels. In other words,

I am convinced that over a period of years the uniform
2453 price level method of ascertaining salvage is the only
one that will approach accuracy in estimating salvage for depreciation purposes.

Although the adjusted net salvage percentages shown on page 18 for the years 1928 and 1929 are in the neighborhood of 65 to 70 per cent, I have used 55 per cent in developing the depreciation rate. The salvage used in depreciation rates should reflect the proper weighting of equipment re-used and junked. In a growing plant, the purchase of new equipment gives undue weighting to the re-use of all equipment, and does not reflect the salvage derived from junking in its true relation. In order to obtain the correct salvage for items of this kind it is necessary to ascertain how many times, on the average, the equipment will be re-used before it is junked and then to determine what salvage may be expected upon re-use and upon junking.

Our studies have indicated that in the case of non-multiple private branch exchanges with a six-year life in one place,

two re-uses may be expected before final junking. The
2454 net salvage which we obtain upon re-use of this equip-
ment approximates 80 per cent, the other 20 per cent being the cost of installation and other things that are lost

upon removal, and when the equipment is finally junked we obtain about 5 per cent net salvage. On this basis, obtaining salvage at 80 per cent twice, and 5 per cent once, the average net salvage per service life is 55 per cent, by arithmetical computation.

The life of six years and salvage of 55 per cent gives the rate of 7½ per cent applicable to non-multiple and small dial private branch exchanges.

The other sub-class of private branch exchanges is multiple and large dial. These boards, which are the larger switchboards placed at subscribers' premises, are very similar in their life characteristics to central office equipment. While the switchboard is placed and retired as a unit, in accordance
with the requirements of the subscriber, there is a grad-
2455 ual process of building up from the initial installation
to the equipment finally retired as the subscribers' requirements increase. Some of these boards are very similar to central office equipment, consisting of large switchboards of many positions, that is, many operators. Of course, the effect of additions upon the life of this equipment is not so great as in the case of central office equipment, because the additions are relatively smaller and perhaps placed less frequently. The result of a study which I have made of a large number of these switchboards to ascertain the relation of the average equipment life to the age of the initial installation is shown in the upper chart on page 19 (A-128). This curve which is plotted in the chart shows that at any selected given age the life would be as indicated by the curve. Of course, it is necessary in the use of this curve to estimate or ascertain, if possible, the average over-all life of the installation. This is not available as in the case of central office equipment. There we have a fairly good idea of about when our offices will be retired. Here we have no idea as to specific dates for individual installations. We are, however, able to estimate
(I think with a reasonable degree of accuracy) the aver-
2456 age over-all life of this type of installation and in arriving
at a conclusion as to that I have conferred with commercial men and engineers who are continuously in touch

with this type of equipment, and I might say it was our joint conclusion that the average over-all life of the multiple private branch exchanges would not exceed fifteen years. With an over-all life of fifteen years, the average life may be ascertained by following the heavy vertical line on the upper chart from age fifteen upward until it intercepts the life curve which is at approximately twelve years. That is the average life that we have estimated for that type of equipment. The lower chart on page 19 merely indicates the volume of data available at all ages for the study of the relation of average life to over-all life, that is, the volume of data in the company's records which was available and which was used in the curve at the top of page 19.

I might say here that in connection with this estimate of average over-all life of fifteen years, we analyzed the average over-all age of the boards which have been retired over quite a number of years, and found that they were retired at
2457 an average of nine years. We also ascertained the average age of the existing boards, which was but six years. These two results compare with the fifteen years which we estimated for the existing equipment.

2458 The actual salvage derived from the retirement of multiple private branch exchanges is shown on page 20 (A-128). As I said before, the separate recording of this salvage experience in the Company's records or books was only available for the years 1928 and 1929, but, as a very large portion of these boards were placed under a record system that permits of an analysis of the salvage experience by investigation of the individual records, we made such an investigation back to 1925, with the results shown on this chart.

It was not possible to convert this salvage to the uniform cost level, because of the lack of index numbers for the numerous types of boards that are involved. We did, however, study the two principal types, which showed but little difference between the actual and the uniform price salvage, which is due largely to the fact that these boards are not greatly re-used, and the salvage is consequently small.

The net salvage for the period analyzed ranges generally

from 20 to 25 per cent, as shown in the lower chart, except for the year of 1927, at which time the salvage increased 2450 to approximately 35 per cent, but which was due to one or two rather unusually favorable opportunities for re-use. This experience, however, has been based upon switchboards which have been retired at an average over-all age of nine years, and would, of course, have to be modified if associated with equipment expected to survive to an average age of fifteen years.

In view of this and the experience indicated on page 20 (A-128), I estimated an average net salvage of 15 per cent for this type of equipment.

So with twelve years as the average life, and 15 per cent the salvage, the rate of 7.1 per cent for the multiple and large dial private branch exchanges is obtained.

That, composited with the 7.5 per cent in the case of non-multiple and small dial, gives, as shown on page 10, the rate of 7.3 per cent as the applicable rate for computing depreciation expense for the main class of private branch exchanges.

The next principal class of property in group 2 is exchange aerial cable. Page 21 (A-128) shows the results of the 2460 analyses which we have made of life for various bands of years from 1912 to 1928. It will be noted that prior to the World War the indicated life was less than 15 years for this class of property. During the War and the period of high prices immediately following, the life indications increased temporarily to quite some extent. This was due primarily to the curtailment of retirements during the war, and the period immediately following, resulting from our inability to secure cable, labor shortage and restrictive curtailment during the period of high prices.

Recent experience, as shown by this chart, indicates a rather relatively short life, the latest band indicating a life of about thirteen years. I, in considering this matter, however, concluded that advanced engineering methods and certain other factors pertaining to the character of the plant in question, would safely permit me to use an average life somewhat in excess of that most recently shown, and I estimated an average life of sixteen years for exchange aerial cable.

The actual salvage experience for exchange aerial cable is shown on page 22 (A-128) for a considerable period of years.

2461 The net salvage which we obtain from this class of property is usually derived through the re-use of terminals, and the junking of the cable. A very small amount of aerial cable is re-used, because it is cut up into short lengths in service by the frequent placing of terminals in which the splice interrupts the continuity of the cable, and furthermore, it is difficult to rehandle aerial cable in such a manner that it is satisfactory for re-use, in view of the fact that the cable itself, the material, is not a particularly costly item in relation to the total cost in place.

Our average experience over quite a number of years has indicated a net salvage averaging approximately 10 per cent, and although changes in the character of the type of materials might justify a lower percentage than that in our depreciation rates, I have considered that it would not be of sufficient magnitude to justify an estimate differing from this more recent experience, and have used 10 per cent.

The sixteen year life, 10 per cent salvage, gives the rate of 5.6 per cent for exchange aerial cable.

2462 The next class in group 2 is exchange underground cable. The exchange underground cable is segregated into four well defined groups. The various segregations are indicated by the four charts shown on page 23 and the life experience for each group is shown thereon. Main subscribers' cable, the life experience for which is shown in the upper chart, has had an increasing life trend from the pre-war experience of about 17 years to a maximum of some 28 years, resulting from the conditions which I have described for exchange aerial cable, and more recently a downward trend in the life, culminating in the latest band analyzed, which showed twenty years.

I have kept in mind in basing conclusions upon the results of these studies that we have an increasing amount of full-sized cables, which are probably not fully reflected in the result shown. In order to make adequate allowance for a longer life for the full-sized cable, I have estimated an average life for main subscribers' cable of 25 years.

In the case of trunk cable, we expect a somewhat longer life than we do for main subscribers' cable and, in spite of the indicated life on the second chart, which is less than 25 years, I have used 27 years for this class of property. As shown in the third chart, the life of subsidiary cable is substantially shorter than that of the former two classes. This is due to the influence on these cables of changes in the distributing plant. Although recent experience has indicated an average life in the neighborhood of twelve years, I have used fifteen years, in the belief that the future experience will show an increase over these studies.

The final class of property, that of house cable, is shown on the lower chart on page 23. While there has been some variation in these life indications, principally due to the unusual conditions which I have previously referred to, I have used the latest indicated life shown on the chart in our depreciation rates, that of twenty-two years.

The salvage from the retirement of underground cable is rather largely dependent upon junk prices, as a very large proportion of the cable is junked upon removal. The salvage experience for the various types of cable is shown on page 25. Unfortunately, we had no separation between main subscribers, trunk and subsidiary cables in the salvage records of the company prior to 1929. The salvage experience for the separate classes of property, however, with relation to the combined experience as shown for years prior to 1929 is indicated by the small cross lines on the year of 1929. The net salvage for the several classes of property has ranged generally from 20 to 40 per cent, the higher salvage being in the earlier period, at which time somewhat greater re-use of the cable was necessarily made because of some restrictions in obtaining new cable.

2464

The combined salvage experience shown in the lower chart is also influenced by the proportionate amounts of the different classes of cable included in the retirement. We know, for example, that subsidiary cable produces either no salvage, or a net loss, on retirement, so that if that was in undue proportion in any year, as I happen to know it was in the year 1921,

it would account for a reduction in the combined average net result.

Due to the similarity of the cables contained in the main subscribers' and trunk classifications, we expect the same net salvage for both groups, and the actual experience for the year of 1929 indicates that to be a fact. Studies of the costs of these cables indicate that where a cable is re-used, we
2465 may expect a net salvage approximating 70 per cent, and where it is junked, a net salvage of approximately 20 per cent. Studies of recent retirements have indicated that around 20 per cent of retired cable is re-used, and 80 per cent junked.

On the basis of these relations and the computed salvage derived through both classes of retirements, the average net salvage is 30 per cent for both main subscribers' and trunk cable.

Practically all of the subsidiary cable is junked, and our previous estimates have placed the net salvage at zero per cent. The amount of this salvage shown for the year 1929 was about 10 per cent loss. However, we concluded that until we had further actual experience on which to base a new estimate, we would adhere to the former estimates of zero salvage.

In the case of house cable, there is no question as to the amount of salvage derived. The chart on page 26 shows the net salvage to have averaged about zero per cent for a considerable period. That is not true for house cable based on experience down to the beginning of the present year. We are finding that the salvage experience of house cable
2466 during the last three years is in the nature of a loss. In other words, the cost of removal is in excess of the value of the recovered materials. We are, however, still dealing with house cable at zero salvage.

The reason that we have no example in this exhibit of the results of our studies of the life of load coils is that we were unable to study them separately between exchange and toll, so that they have been included in another exhibit, but we did make a mortality study of the life of the combined exchange

and toll load coils in Chicago, and arrived at certain
2467 conclusions. Load coils are included as a part of this class of property, with a finding of ten years as the average life, and 40 per cent salvage, giving a 6 per cent rate. The composite rate for the class of plant as a whole is 3.4 per cent.

That covers the complete explanation of methods of studying life and salvage for all property in group 2, and also explains the bases of our conclusions with respect to life and salvage used in the depreciation rates for the principal accounts in that group.

The several classes of property contained in group 3 are shown on page 27 (A-128), together with the relative investment, the average service lives, expected average net
2468 salvage upon retirement, and resulting annual rates of depreciation for each sub-class of property, and the composite rates applicable to the investments in each account.

While the life characteristics of the property contained in this group are similar to those which have been included in group 2, it is considered impracticable, if not impossible, to make mortality studies of life for this property, due to the burdensome requirement of ascertaining and then maintaining the required data as to the placing and retirement dates of individual items. For that reason, these classes of property have been studied by a somewhat different process, known as the turn-over cycle method of analyzing life.

In order to illustrate the principle involved in this form of study, I have arranged the example shown on page 28 of the exhibit of a non-growing plant with an average life of five years. Referring to the five lower diagonal lines of rectangles, which indicate the surviving property from all previous installations and the retired property in each of the years 1924 to 1928, the sum of the upper figures shows that 500,000 units were in service at the beginning of each year, and the sum of the lower figures shows that 100,000
2469 units were retired in each of the five years. This simply means that a plant of 500,000 units was maintained in static condition by the replacement of 100,000 units each year,

for simplicity. The information shown in the summarized tabulation at the upper right hand corner of the chart has been transferred to the table at the bottom of the chart designated "Summarization of Data by Years", which represents the kind of information that is available in the Company's records. In other words, the information that I have assumed in this tabulation as to placing and retirement dates is not available for this property, but the amount in service and the amount retired each year is available. By accumulating the retirements shown in column 2 (Page 28, Exhibit A-128) in reverse chronological order, or backwards until they equal the amount of plant in service at some previous date, the average life may be determined. This computation has been made in column 3, and the result shows that it requires five years to accumulate the 500,000 units in service in column 4. This is in accord with the known life used in the example. For convenience, this information is shown in the form of curves in the small chart at the lower right hand corner of the page, in which the diagonal line representing the accumulation of retirements covers a period of five years, to equal the amount of plant in service at some earlier 2470 date.

That chart deals with an assumed non-growing property. In the next chart I take into consideration the factor of growth. I do that because the turn-over period in a growing plant, unlike that of a static plant, is always less than the correct average life, and it is, therefore, necessary to make certain computations to provide for this difference. The difference between the period shown by the turn-over method and the correct average life is brought about in a growing property by the effect of units retired at less than average life more than offsetting the units retired at ages greater than average life. In other words, in a growing plant, the younger plant is retired in greater proportion to the whole than is the case in a static plant.

Page 29 (A-128) offers an example of a property having a five-year average life and a 10 per cent annual rate of growth. It will be noted in column A that instead of merely offsetting

the retirement each year, the additions grow progressively larger, otherwise the form is similar to that shown on page 28.

Following the same procedure which I have described
2471 for the computations with respect to page 28, we note in the lower right-hand corner of the chart that an average turn-over period of 4.6 years is developed, although we know that the life used in the example is five years.

Page 30 (A-128) will serve to illustrate the method employed in compensating for the effect of growth on the result indicated by the turn-over cycle method. Figure 1 on page 30 shows certain actual data of recent years for station apparatus arranged in tabulated form similar to that which I have used and described in the preceding examples. Figure 2 has also been arranged to show the graphical description of the turn-over period results in a manner similar to that which I have previously described.

One of the steps necessary in determining the amount of compensation to be added to the results of the turn-over period to represent correct life is to find the rate of growth during the period under consideration. For convenience, this is determined as the ratio of the amount of plant at the end to the amount at the beginning of the turn-over period. The amounts used in these computations are based on an equiv-
alent uniform annual rate of growth in order to elimi-
2472 nate fluctuations in individual years that may distort the results from a more representative basis desired. This ratio is most conveniently determined by the use of logarithmic paper, as shown in figure 3 on page 30, in which the result of the period under consideration with respect to station apparatus is a ratio of 1.2.

Another factor which must be considered in providing for the proper compensation in the results of the turn-over periods in a growing plant is that of the age distribution of the retirements. Where a higher rate of mortality occurs at early ages, the effect of plant placed and retired during the turn-over period is greater than where the mortality rates are high at later ages of life. For instance, on page 29 we note that this property has an average life of five years, although the

turn-over period indicates but 4.6 years. We are therefore able to determine that with this type of age distribution of the retirements and the annual rate of growth of 10 per cent, the period shown by the turn-over analysis requires an adjustment of four-tenths of one year, or an increase of 9 per cent of 4.6 years. This compensation, that is, percentage increase to be applied to the results indicated by the turn-over cycle method, varies with the rate of growth and the
2473 type of life table involved, and has been determined for various representative life tables and growth ratios, one of which is shown in figure 4 on page 30.

I have explained the turn-over cycle method as I have applied it in arriving at the depreciation rates charged by the Company in the Chicago area. The classes of property to which I apply the method are classes for which I have adequate data in the recorded experience and records of the company for its appropriate and sound application. I have used this method in analyzing the life experience of all the classes of property in Group 3.

In this exhibit, I show the details of the application with respect to the principal class of property contained in the group. Station apparatus, which is the first class in group 3, comprises about 10 per cent of the total investment in
2474 depreciable property in Chicago, and about 80 per cent of the depreciable property included in the group. In view of that fact, for the sake of brevity, I thought it would be satisfactory to merely explain conclusions with respect to that classification, sub-station equipment.

On page 32 (A-128) I have made that application. The upper chart on page 32 shows the results of our turn-over study analysis for station apparatus for various periods over quite a long time. These results show a variation in the average life of from about four and a half years for the period ending in 1917 to a high indicated average life for the period ending in 1924, at which time the life indicated was eight and a half years, and back to an average life of approximately four and a half years for the period ending in 1929. The long turn-over periods shown in this chart subsequent to the

war were due primarily to abnormal restrictions brought about by the war and the conditions prevailing immediately thereafter. The influence of the restricted retirements, with their resulting indication of an increase in life, natur-
2475 ally continue until sufficient time has elapsed to eliminate their effect. This will be seen by comparing the retirement rates for station apparatus, as shown on page 31, with the results of the turn-over studies as shown on page 32.

Referring to page 31, it will be noted that the lowest rate of retirement for station apparatus as shown in the upper right hand chart on that page occurred in 1920. Returning to page 32, it will be seen, however, that the longest life indicated by the turn-over studies does not occur until 1924. The 1924 study reflects the low retirement rates back to 1918, but has no weighting of the higher rates prior to that time. In other words, there is a considerable lag between the incidence of low retirement rates and their reflection in the turn-over cycle studies.

Turning again to page 31 (A-128), it will be noted that by 1924 the retirement rates had risen to 16 per cent from the low point of 10 per cent in 1920. Since 1924 the retirement rates at no time have been less than 19 per cent, and in the three most recent years they have been between 27 and 28 per cent. The conclusion I draw from the increasing retirement rates as shown on page 31 is that this greater rate of retire-
ment has not yet been reflected in the results of the
2476 turn-over cycle studies, and, making due allowance for that, and with a consideration of the possibility of a further shortening effect of the introduction of new types of station apparatus as compared to our past experience, I have estimated an average life for that class of property of four and a half years.

The lower chart on page 32 (A-128) shows the results of a turn-over study of telephone typewriters, or, as we now call them, teletypewriters. This property represents a negligible part of the investment in the station apparatus account. From this information, a service life of three years was estimated.

Page 33 (A-128) shows the salvage experience for station

apparatus since 1914. Separate salvage percentages are shown for complete station retirements and partial retirements, which we refer to as component parts on the chart, as well as the composite salvage derived from both types of retirements. While the actual salvage has varied to a considerable extent during the period shown on this chart,
2477 the adjusted salvage, that is, the salvage at uniform cost level, has remained rather consistently around 75 per cent.

As explained, for private branch exchanges, the salvage shown on page 33 (A-128), which is the salvage set up on the books of the company, reflects the various weightings that may occur in our normal experience of re-used and junked apparatus. As the effect of growth produces a disproportionately large reflection of the re-used salvage in the actual experience of the Company, it is necessary, as I explained, with the private branch exchanges, to consider how many times we may re-use this type of equipment before finally junking it. Our investigations have indicated that, based on an average service life, or life in one place, of four and a half years, we may expect, on the average, three re-uses before the final junking of the station apparatus. Investigations of possible salvage derived through both processes of recovery have indicated that for equipment re-used, we may expect an average net salvage of about 92 per cent on the original cost of the equipment retired, and when junked, about 5 per cent.

Computing the salvage on the basis of three re-uses at 92 per cent and final junking at 5 per cent, results in an average net salvage per service life of 70 per cent, which has been used in the depreciation rates.

2478 Computations similar to those for station apparatus have been made for telephone typewriters, based on three service lives, the re-use salvage of 95 per cent and junk salvage of 5 per cent resulting in an average net salvage per service life of 65 per cent for that type of apparatus.

That completes the study for both sub-classes of station apparatus, giving the rate of 6.7 per cent for substation apparatus and of 11.7 per cent for telephone typewriters and a

rate applicable to the entire class of property of 6.8 per cent.

The life and salvage conclusions as to the remaining minor classes in group 3 have been based upon a careful investigation of not alone the result of similar studies of life and salvage, but upon all available information, in the nature of conferences with various telephone people in our company who may be in a position to know what has influenced
2479 past experience, and what we may expect to find influencing our future experience. In other words, because the accounts represent a very small part of the investment and the depreciation expense, we have not neglected them and arrived at any arbitrary conclusion. We have gone through the same careful process with respect to all accounts as we have in the case of this one account which I have selected for explanatory purposes.

With that explanation, it is sufficient to refer again to page 27 of the exhibit, where are shown the life, salvage, the basic rate and composite rate for each of those classes. The rates there shown are, in my judgment, arrived at by correct and sound methods, upon adequate data, and are correct results.

May 16, 1932

2482 The classes of property which I have included in group 4, together with the relative proportions of the investment, average service lives, expected net salvage and depreciation rates, are shown on page 34 of Exhibit A-128. Aside from the underground conduit, all of the property in this group represents a negligible part of the total depreciable property. While 10 per cent of the total investment in depreciable property is in underground conduit, due to the low rate of depreciation, the amount of depreciation expense associated with that item is but 4 per cent of the total. The depreciation expense relating to all of the other classes of property included in group 4 is a combined depreciation expense of but 2 per cent of the total.

I am attempting to emphasize the rather negligible amount of expense involved in these items, for the reason that, unlike

the other three groups of property, we have no experience relating to life that would be significant in arriving at conclusions. In other words, the past experience for these classes of property is short, relative to the average life of each class
of property. For that reason it has been necessary to
2483 refer to other classes of property that are of somewhat similar types, and arrive at conclusions respecting life from that information and all other types that can be obtained, or rely solely upon judgment.

It will be noted that the element of salvage is not a very vital problem in this group of property, as there is practically no salvage associated with any of the classes except cable.

As appears on pages 35 and 36 of Exhibit A-128, I have selected for explanation of the methods employed in arriving at the depreciation rates for this group, the main account in this group, which is underground conduit.

This particular method that we have followed in analyzing such information as is available for underground conduit, is not identical with the other procedures followed in connection with the classes of property in group 4. This is merely an illustration of one of the types of methods followed in attempting to aid judgment in arriving at conclusions respecting life. Underground conduit, as in the case of central
office equipment, is influenced by an initial construction
2484 and subsequent additions. That is, in the same trench we will place an initial amount of conduit and later add to it, so that there is a decided difference in many cases between the average life of the conduit and the age of the trench. In that connection, the characteristics of the life are somewhat similar to central office equipment.

Information regarding the placing and retirement dates of underground conduit is available in the Company's records, and I have analyzed that experience, with the results shown on page 35 of Exhibit A-128. The purpose of the upper chart on page 35 is to show the relation of the average life of the conduit itself to the life of the trench, or to the age of the initial conduit placed in the trench.

While an average life has been estimated for main underground conduit of 50 years, which includes manholes, this life will allow for a much greater average life of the trench. As may be noted in the upper chart, at an average initial age of 40 years, the average life of conduit is but 26 years. With that ratio in mind it can be foreseen that we may expe-
2485 rience an average trench life of our conduit of upwards of 100 years on the basis of an average life of 50 years for the conduit.

There is another point about this chart that I just want to mention briefly, and that is that we were unable to analyze the dollars of underground conduit with respect to placing and retirement dates. In other words, we were unable to earmark the dollars themselves, but our analysis was made on the basis of the property itself; and in order to properly weight it together, we used a common cost level pricing. That means that we have not given as much weight by that process to the later additions as would be justified by the increasing costs, and as the later additions are of shorter life, naturally, the ratio based on the actual investment would be in excess of this. That is, if we could estimate that with a life of 50 years for the conduit, a trench life of 100 years on the average would be experienced, for the common cost level. The trench life would be even greater if an analysis were available of the book dollars, so that the use of a life of 50 years makes allowance for a very long average trench life.

2486 The lower chart on page 35 merely shows the volume of data available for this analysis at all ages. It is expressed in millions of dollars. Due to the shortening effect on the lateral conduit of rearrangements of the distributing plant, I have estimated an average life of 30 years for subsidiary conduit.

The entire salvage experience for underground conduit back to 1914 is shown on page 36, and shows very conclusively that our retirements throughout this entire period resulted in losses. That is, that the cost of the removal or abandonment has exceeded any salvage that we might derive from recovered materials. This experience, however, has been based

rather largely upon the rebuilding of manholes in Chicago, where there has been a great deal of that work in the past; and although this experience that we have analyzed would justify perhaps a net loss of 10 per cent, we have continued the use of zero salvage in expectation that our losses associated with the conduit proper as distinguished from the manholes, will not be of a material amount. We actually expect losses for all types of conduit, but we do not expect it
2487 to be as severe as this analysis would indicate. So for that reason we have used zero net salvage.

Because of the long life of this class of property (50 years for main exchange underground conduit, and 30 years for the subsidiary underground conduit) and zero salvage, we get the very low depreciation expense rate of 2 per cent for the main conduit, and 3.3 per cent for the subsidiary, making a composite rate for all conduit of 2.3 per cent.

The property comprising group 4 represents about 13 per cent of the depreciable property in Chicago on the investment basis. The exchange underground conduit which I have studied here in detail constitutes approximately 10 per cent of the total depreciable property in Chicago.

I have described the methods employed in finding life and salvage for all depreciable property in each group. I
2488 have also shown the results derived from these studies, and described the basis for my conclusions in regard to the lives and salvage percentages used in determining the depreciation rates for the principal classes of property. I have followed the same procedure for the other classes of property in each of the four groups. (Document entitled "Illinois Bell Telephone Company, Chicago Area, January 1, 1930, Depreciation Study, Life and Salvage Data" was marked for identification as Plaintiff's Exhibit A-129.)

This exhibit (A-129) shows the life and salvage investigations made by me for the remaining classes of property in each of the three groups (I say, the three groups, because group 1 was studied in its entirety) in a manner similar to that which I have already explained in my testimony, and which has been set forth graphically in the preceding exhibit.

so far as there were data available for these classes shown in A-129. I think that reference to pages 1-A and 2 will show that the same form of showing the results of life and
2489 salvage studies respectively, will indicate that the exhibit is self-explanatory after the explanation that I have given for Exhibit A-128. The charts and data in this exhibit will be readily understood from the testimony I have already given concerning the next preceding exhibit.

This exhibit, as well as the others that have been identified in my testimony, was furnished to counsel for defendants, and the underlying data made accessible to them also, last August.

Less than 9 per cent of the investment, and also less than 9 per cent of the depreciation expense is represented by Exhibit A-129. The depreciation rates for the classes of property covered by this exhibit appear in Exhibit A-128 on pages 10, 27 and 34.

2490 The fourteen pages of explanatory text, which is a part of Exhibit A-128, are correct, and are to be understood as a part of my testimony in the case. It is in effect a brief summary of the testimony which I have given.

(Exhibits marked for identification A-125 to A-129, both inclusive, offered in evidence by plaintiff. Objections reserved.)

Mr. Thompson: If your Honor please, during the cross-examination of Mr. Edgar S. Bloom, President of the Western Electric Company, he was asked as to what information the Western Electric Company had received from the American Telephone and Telegraph Company, in connection with
2491 provisional estimates, delivered to the American Telephone and Telegraph Company by the Bell associated companies, and by the Long Lines Department of the American Telephone and Telegraph Company. He testified in substance that the portion of the provisional estimates of each of the Bell associated companies and the Long Lines Departments containing information respecting the estimated quantities of material required to be delivered by the Western Electric Company was delivered to the Western Electric Company, although he did not personally inspect these estimates.

He said that what he received were summaries showing the future plant requirements and station growth. We have assembled in folders for each of the years 1923 to 1932, inclusive, that portion of the provisional estimates of each of the Bell associated companies, and the Long Lines Department, which were delivered to the Western Electric Company by the American Telephone and Telegraph Company.

"These are identified for the years 1923 to and including 1930, as Statement C of provisional estimates, and for the years 1931 and 1932, as Statement E. There is also included in these folders for each of the years, the summary,
2492 showing plant requirements and stations expected to be gained. In some cases these summaries were made up by the Western Electric Company, and in others, by the American Telephone and Telegraph Company, but without respect to whether they were compiled by one or the other of the companies, they have been included in these folders.

"Similar data for 1922, and the preceding years, have been destroyed by the Western Electric Company in the regular course of its business, and are not available.

"And now we are in open court offering these provisional estimates and the summaries which I have described, to counsel for the defendants. They are the original papers, we have no copies of them, and we would like to have them carefully preserved; and if they are to be used in evidence, we would like to have you make copies, and return the originals to us.

"Mr. Goldstein: Mr. Thompson, may I ask if there is included in here the letter from the President of each of the associated companies explaining the character of the requirements and describing the purpose of them, and their plan of use?

"Mr. Thompson: I was sure you would ask that question, Mr. Goldstein, and I called Mr. Stoll, the Operating
2493 Vice President of the Western Electric Company, this morning, and he advised me, although I did not speak to him directly, that so far as he knows, there were no such letters of transmittal.

"Mr. Goldstein: That is, there were no letters from the

President of the Company to the American Telephone and Telegraph Company, or from the American Telephone and Telegraph Company to the Western Electric Company?

"Mr. Thompson: From the American Telephone and Telegraph Company to the Western Electric.

"Mr. Goldstein: That is the situation?

"Mr. Thompson: Yes, sir.

"Mr. Goldstein: Very well."

ARTHUR HUNTER, called as a witness on behalf of the plaintiff, having been first duly sworn, testified as follows:

Direct Examination by Mr. Thompson.

May 16, 1932.

My name is Arthur Hunter. I reside in Montclair,
2494 New Jersey. I am an actuary and am now employed by the New York Life Insurance Company, as Chief Actuary and Vice President. I have been Chief Actuary of that company for about 10 years. Prior to that time, I was Actuary and Assistant Actuary. In all, I have been 34 years in the service of the company in actuarial work.

In my position as Chief Actuary of the New York Life Insurance Company, my duties, in a general way are to determine the premiums under all conditions; to determine what extra premiums should be charged to meet cases of hazardous occupation, of persons with medical impairments, such as heart murmurs, albumin in the urine, tuberculosis in family history; to determine what extra premiums should be charged for residence in tropical countries; to ascertain the surplus at the end of the year; to distribute the dividends; and also at the end of the year to determine what the valuation of the liabilities of the company should be for both life insurance policies and annuities. That merely gives a very brief explanation of my work.

2495 In general, I am responsible for the actuarial determination of all liabilities of the New York Life Insurance Company from year to year.

Before my connection with the New York Life Insurance Company, I had been the Actuary for the Fidelity Mutual Life Insurance Company of Philadelphia for 5 years.

I was in the Life Association of Scotland, at Edinburgh, for a period of 6 years. During that time I served under the old apprenticeship system. I was guaranteed to receive training in each department of the company, and was permitted sufficient time to attend lectures which were given by the Faculty of Actuaries. In order to obtain my degree as actuary it was necessary to study about 4 hours each night for 6 or 7 months a year, for 6 or 7 years, and in that way I obtained both the practical and theoretical, under what may be termed the hardest task masters in the world.

2496 I am a fellow of the Actuarial Society of America, the American Institute of Actuaries, the Faculty of Actuaries of Scotland, and the Casualty Actuarial Society of America. I was President of the Actuarial Society of America during the World War. I was Chief Actuarial Advisor to the Government during the war, and was Chairman of the Advisory Committee which handled all of the insurance for the soldiers and sailors. That was called the War Risk Bureau. During the war I was Chairman of the Committee which handled all of the insurance for the National Red Cross, and I also did similar work as a member of the Committee for the Young Men's Christian Association.

2497 I have the honorary degree of LLD. from Edinburgh University, which is the highest honor granted by that university. That was given to me for scientific work along actuarial lines.

I am the author of the Makehamized American Table, which is used by many states to make calculations of reserve valuation for joint life policies and other complicated calculations. I am also the author of the American Annuitants' Table, which was prepared from the experience of the principal American companies, and is used as the standard of valuation in many states. I am also the author of Hunter's Disability Tables, which is the standard of valuation for disability benefits practically throughout the country.

I was Chairman of the Committee of the Actuarial
2498 Society of America which was first to investigate the subject of blood pressure, during which we had something like 700,000 lives to analyze. I have also been Chairman for 20 years of the Joint Committee of the Actuarial Society and the Medical Directors' Association, which has charge of making investigations of all kinds for life insurance companies. During that time we have published volumes covering about 1,200 pages, involving over 4,000,000 lives, on all kinds of investigations, finding out what the mortality would be of people who had various types of heart murmurs, who had a history of tuberculosis of every kind; and practically all of that I have written myself.

I have been engaged in the past by the United States Steel Corporation, the Pennsylvania Railroad Company, the Norfolk and Western Railroad Company, the National City Bank of New York, and the American Car and Foundry Associa-
tion with respect to the establishment of pension fund
2499 plans or the revision of plans already in existence. In some of these cases the work I did was to establish systems for them; and other times it was to revise what they had already in force.

I was Chairman of the Committee of Actuaries that advised both with the Carnegie Foundation and the Association of Professors of American Colleges to draft plans for a pension plan for the benefit of the universities and colleges of America, which would succeed those plans which had been in effect by the Carnegie Foundation.

On March 28, 1932, I was employed by the Western Electric Company to make a study in connection with its Pension Fund Plan. Prior to that time, I had never had any employ-
ment with the Western Electric Company of any kind,
2500 or any knowledge of its Pension Fund Plan or the administration of that plan by the company. I was asked to determine, from their records, the facts necessary to find out what contribution should be made by the company, and what its accrued liability should be.

In order to do that I had to check the statistics which the

company had employed in various tables and had to find out the accrued liability at the end of specified years. I did not know at that time, and I do not now know, what amounts had been placed in the Pension Fund by the Western Electric Company. My sole purpose was to determine what should be done and not what had been done.

In connection with this employment, I first investi-
2501 gated the shape in which the records had been kept by the Western Electric Company. I did endeavor to find out how well these had been kept and whether they were in such shape as to enable me to determine accurately the contribution which the company should make towards the Pension Fund and how much it should have on hand at certain periods. I investigated thoroughly the records of the company, so far as it seemed necessary to do so. I found that the company had its records in as good shape, if not in better shape, than any industrial corporation which I have seen. I received a very large amount of work from Mr. Burgess, Chief Statistician of the Western Electric Company, or through him. He made a great many calculations for me under my direction, but I could not estimate just how much that would be. In addition the members of my own staff checked up on whatever seemed necessary.

I found that I had enough records and enough available
data of the Western Electric to enable me to perform
2502 the work that I have been employed to do.

I have examined the pamphlet entitled "Plan for Employees' Pensions, Disability Benefits, and Death Benefits, Western Electric Company" and I am familiar with the provisions of that plan in so far as they affect the Service Pension Plan of the Western Electric Company.

(Which said plan was marked for identification as Plaintiff's Exhibit A-130.)

2503 The Service Pension Plan of the Western Electric Company provides for the retirement of male employees at 60 years of age, after 20 years of service; and for female employees, at age 55, after 20 years of service. There are two smaller classes with an earlier retirement age. The

employee, under the present plan, must retire at age 65, unless granted permission to remain longer. The pension consists of 1 per cent of the average annual pay, during the 10 years next preceding the retirement, for each year of service, but the committee has the power to base the pension on the average annual salary for the 10 consecutive years in which the highest rate of salary was paid. The minimum pension is $30 per month. The pensions are payable monthly, and cease at the death of the retired employee. The employees do not contribute to the Pension Fund. Layoffs are provided for; that is, credit may be given for past services without any loss to the employees. For example, at the end of four and a half years of service, the employee would receive credit for his service if he were employed within a period of 12
2504 months. Provision is also made for bridging breaks in service, as it is technically called; for example, if a man had been 5 years in the service, left it, and returned after 3 years, he would be automatically given credit for his 5 years of service after he had been continuously in service for another period of 10 years.

The net effect of the provision for bridging breaks in service is that if an employee leaves the service and returns later, and has that term of continuous service which the plan provides for, he may still avail himself of the Pension Fund features of the Western Electric Company and get credit for his service before he left the company's employment, although the term of service has not been continuous.

In my opinion, it is an important feature of the Pension Plan that provision should be made year by year for the cost of the pensions.

The simplest illustration which I can think of, showing the method of providing for such accrued liabilities or reserve, is that of a bond with a sinking fund, providing for the pay-
——ment of the face of the bond, of, say, ten thousand dol-
2505 lars, at the end of 30 years. There interest only is involved. If, however, a life insurance company were to undertake to pay an annuity at the end of that period another factor would be involved, namely, mortality. At the

end of these 30 years, it might be said that it called for ten thousand dollars to purchase an annuity of one thousand dollars per year, so that the company must have in hand, at the end of that period of 30 years, ten thousand dollars, just as in the case of the sinking fund bond; but a smaller amount will be required because the element of mortality is also included. Now, I am talking, of course, of a group of people, not of one individual. There must be enough to provide an average over that period. If an industrial corporation were to decide that they wished to provide for a pension, there would be another element involved in addition to the two already mentioned, and that would be the discontinuances which had happened, voluntarily or involuntarily, during the period before the pension became due. That would make the sinking fund, if we may so call it, or the contribution by the company, smaller than in either of the other two illustrations which I have given. That is because there is introduced the additional factor of discontinuances.

2506 I first determined the liability or reserve for those now pensioned; that is one of my first problems. There are four factors involved in this determination. First of all we must know the age at which the pensioner retires; second, the amount of the pension which he is to receive; third, the period over which the pension would be payable, which involves the mortality table; and fourth, the rate of interest which would be necessary in the calculation.

I determined the average age of retirement directly from the records of the company. The amount of pensions to be paid on retirement was also determined from the records of the company by obtaining the salary scale according to the groups of age at entry and according to the period of service. In order to determine the period over which the pensions were likely to be payable, I adopted for that factor the American Annuitants' Table of Mortality, which is a
2507 standard, and generally used by life insurance companies. After making investigations I came to the conclusion that that was the most suitable table to use.

I used the rate of interest of 4 per cent, after considering

the matter very carefully. This is the highest rate of interest used by any life insurance company (and these are very few). The rate of three and a half per cent is used especially by what are known as non-participating or stock companies. The conservative companies, the large mutual insurance companies, generally use 3 per cent in determining the value of their future obligation under life insurance policies and annuities.

If interest is compounded semi-annually at the rate of 4 per cent, it is equivalent at the end of the year to 4.04 per cent. So when I have used 4 per cent as my interest assumption, there is that additional factor of .04 per cent
2508 because of the compounding of the interest semi-annually. The higher the rate of interest assumed in the calculations, the lower the amount of accrued liability.

In order to determine how many of the company's employees will continue to live and be in the service of the company at the time they will be entitled to receive pensions, I need to know the distribution of the employees by age and by periods of service, which I obtained from the statistics. I also need to know the rate at which the employees leave the service, either voluntarily or involuntarily, so that I may know, when the pension age arrives, how many of them are still in service to obtain the pension. That requires a voluminous study.

After determining the number of employees expected to receive a pension in order to ascertain the amount of the pension liability, I first determined the distribution by age and by period of service. Then from the salary scale I determine how much pension the employee is entitled to.

2509 The company should determine by what methods its contributions for the purpose of meeting its liability under the plan are to be determined. It is not a sound method to make no provisions for meeting the pension obligations until the pensions have become due. There are other methods whereby provisions are made from year to year for meeting the obligations on account of the pensions which will become due. In my opinion as an actuary, the best method of meeting this liability is to provide, by a flat percentage of the

payroll year by year, a sum sufficient to meet the pensions as they become due. This is equivalent to saying, to meet the reserve liability at the end of each year. By a flat percentage I mean the same percentage of the payroll, irrespective of the age of the employee.

At the present time the Western Electric Company has detailed statistics available with regard to its employees from which I could and did obtain the average age of retirement,
the probable pension payments, and the various other
2510 factors to which I have already referred in my testi-
mony. I have already mentioned certain information which is necessary in order to make a valuation of pension liability, which consists of the following: first, the value of the pension at the date the employee is retired; second, the distribution of employees according to sex, age and length of service; third, the annual rate at which employees continue in service after making allowances for voluntary and involuntary discontinuances; fourth, the average salary at the various ages and the various years of service, which is called a salary scale, or schedule; and last, the interest rate which should be assumed for the future. I have been able to obtain with reasonable accuracy all of the foregoing factors in order
to determine the amount which should have been contrib-
2511 uted by the Western Electric Company in any stated
period of time, and also the accrued liability.

In determining these factors, I used the four censuses which were made by the Western Electric as of March 31, 1925, 1927, 1929 and 1931. That census data, for those 4 years, was full and complete. I also had available a census taken as of March 31, 1923, which was not in so much detail as the data in the censuses for the later years, but entirely sufficient for the purpose for which I needed it. The data furnished to me by the Western Electric Company gave me all of the information which I as an actuary found necessary for my calculations.

I made reasonable tests to determine whether this material had been correctly compiled by the Western Electric Company. These tests showed that the work had been done

2512 honestly, that no attempt had been made to omit any material which I should need. By tracing various groups it was quite apparent that the persons in the group had been followed down from one year to the other. I could not find in going over the detail that there was any evidence but what the work had been done entirely satisfactorily.

The statement, in two sheets, entitled "Western Electric Company, Inc., Present Value of Pension Payroll as of March 31, 1931," was prepared under my direction and supervision.

(Which said document was marked for identification as Plaintiff's Exhibit A-131.)

This exhibit shows the amount which the company should have in hand in order to meet the payments of the pensions as they become due, taking account of the rate of interest, and of the mortality table which has already been specified. The first sheet of this exhibit gives the information as to men only and the second as to women, and then the summary for men and women which comes to a total of $1,637,265.48.

2513 In the first column of this exhibit the age of the pensioner is given (I am referring now to men only); in the second column, the number of men as of that age; and in the third column, the aggregate monthly pension. As shown by the first line covering the age 54, there were 4 men of that age who had an aggregate monthly pension of $395.34. Therefore, since at the value of $1.00 per month we have $148.585, the total amount necessary to meet the pensions of these 4 men was $58,741.59. By following this throughout, we get the total amount at the foot of column E of the value of these pensions to the 225 men on the basis of the American Annuitants' Table with 4 per cent interest. Page 2 of this exhibit contains similar information for women, compiled in a similar way.

This exhibit, of course, refers only to those persons who are actually receiving pensions at this time. It does not purport to show contributions by the company for those not on the pension payroll, but only those who were pensioners at the 31st of March, 1931.

2514 In the 1931 calculations the continuance rates were based on the census for the 6-year period 1925 to 1931, which I have already mentioned. These censuses were made as of March 31 of the years 1925, 1927, 1929 and 1931. I smoothed or graduated these rates by established principles. I made tests by the usual established rules to determine whether these graduated rates compared with the actual rates determined from the company experience and found that they came very closely to the actual conditions. In my judgment, and from my experience as actuary, these continuance rates which I have arrived at are proper and fair rates to apply in view of the experience of the Western Electric Company as I found it. The exhibits marked for identification as Plain-

tiff's Exhibits A-132 and A-133 were prepared under my 2515 direction and supervision. They show the graduated rates of continuance based on the 6-year census. Below the horizontal lines they show the rates of continuance based on the American Man Ultimate Table, which is a standard table of mortality. I assumed that after a certain number of years there would be no persons leaving the service of the company except by death. The information shown on these two sheets was compiled in the same general way except that Exhibit A-132 shows the continuance rates for men, and Exhibit A-133 for women.

By the term "continuance rates" I mean the proportion of the employees who will continue from year to year in the service. For illustration, I will use as an example the column on Exhibit A-132 headed "Entrance at age 20". This shows a figure in the first year of service of .5791. That means

that if there were 10,000 men in the service, according 2516 to the census made of those men which were in service, there would be only 5,791 in service one year later, and if to those 5,791 men were applied the percentage of .7097 we would then obtain the number who would be in service one year later. That process is followed through year by year in the manner that I have indicated, in order to obtain the number of men or women respectively in the other various entrance age groups, who would remain in service at the

end of this succeeding year, or the middle of the succeeding year, as the case may be.

The salary scale was obtained from the census. In that census we need the number of employees, and also their aggregate salary for each year of service, subdivided by a number of groups of ages at entry, generally the quadrennial ages at entry. I smoothed or graduated these average salary scales and they agreed with the actual salaries which were paid.

2517 The instruments marked for identification as Plaintiff's Exhibits A-134 and A-135 were prepared under my direction and supervision from the records of the Western Electric Company. They show the average salaries for certain entrance ages according to years of service. Under age 18 is self-explanatory. In the group under age 20 there appears the quinquennial group of ages from 18 to 22, inclusive, with a central age of 20, and the same is true for each of the others. These show the graduated rates or average rates for each year of service, starting with the first and running down to the thirty-third year. For example, under the heading 20, the average salary of the employees of that group (that is of the quinquennial group) for the first year of service would be $1,080, and in the second year of service, $1,290, etc. In the case of men I found that these graduated

2518 salaries were within one-fifth of 1 per cent of the actual salaries paid by the Western Electric Company, and in the case of women, within one-half of 1 per cent of the actual conditions. The phrase "average man" and "average woman" in Exhibits A-134 and A-135 means the average salary according to each year of service but irrespective of the age of entry. In other words, there was no differentiation under the head of "average man" by the age at which he entered the service. I used the information contained in these two columns principally for checking purposes and in order to make certain tests.

The instrument identified as Plaintiff's Exhibit A-136 was prepared under my direction and supervision from material I had obtained from the Western Electric Company. The

primary purpose of this exhibit was to determine what
2519 percentage of salary should be in hand to meet the value of pensions at age 63, which happens to be the pension age in this exhibit, and also to determine what amount the company should contribute each year per employee to meet the accrued liability. This particular calculation refers itself to a group entering the service at a group age of 33 to 37, or a central age of 35. This calculation is so important in determining what contribution should be made by the company in order to meet its liability, that if it is understood everything else becomes easy:

This (Exhibit A-136) is one of a number of other similar tables which we have called service tables. It starts with 10,000 employees in the middle of their first year of service, which is shown under column B. We could have started with 100,000 or 1,000 employees instead of 10,000, and it would make no difference, because we are getting a percentage to a total group. This number of 10,000 is followed to the middle of each year of service up to the twenty-eighth year,
2520 when there are 1,939 employees in the middle of the twenty-eighth year applying to the original 10,000. The credited continuance rates which we found were based on the experience of the company. In column C there appears the average annual salary, also taken from the records of the company, and this shows how the salary on the average increased for a certain number of years and then became stationary. That is traced all the way down to the twenty-eighth year. Now, if the number of employees in B is multiplied by the average annual salary in C, the total annual earnings of the group are obtained, which, in this case, in the first year of service is $18,500,000. These next two columns, E and F (A-136), are merely the process whereby these annual earnings are accumulated from year to year at the rate of interest at 4 per cent, or the semi-annual rate of 4.04, so as to obtain at the end of the twenty-eighth year, the accumulated salary of the assumed group of 10,000 persons. This can be seen rather clearly by taking the first line under F. The salaries are $18,500,000. The interest for one year, which

can be seen at a glance by subtracting $18,500,000 from $19,247,400 in E, is $747,400. Now, if that $747,400 is added to the annual earnings in the second year, which appear
2521 in D, $12,675,150, the amount at the end of the second year in F is obtained, $31,922,550. That column F simply represents the accumulations of that group, with interest, to the end of the twenty-eighth year.

The purpose of this can now become more apparent. The number of employees at the middle of the twenty-eighth year is 1,939. Now, these people retired at age 63, which is the end of the twenty-eighth year. Deducting from the 1,939 the deaths according to the table, we would have 1,908 persons who are to receive a pension. As these people have been twenty-eight years in the service, they are entitled to 1 per cent for each year of service, that is, 28 per cent. Their average salary is $2,700. Therefore, as a pension, as may be seen from the second line under the total, they are entitled to receive 28 per cent of the $2,700, which is $756, per pensioner.

Now, we want to find out what the value of that pension is, and we turn to the American Annuitants' Table, and find that the value of $1 per annum payable monthly at age 63 is $9.77. The multiplication, therefore, of the pension of $756 by the value of the annuity of $1, that is, $9.77, gives the value to each employee of his pension, namely, $7,386.12. As there were in this group 1,908 employees who were entitled to a pension, the total value is, therefore, $14,092,717. The
2522 next process is to determine how much of the salary should be accumulated during these twenty-eight years in order to have in hand that amount of $14,092,717, and it can be readily obtained by a similar proportion. If the amount required is $14,092,717, and if the salaries accumulated for these twenty-eight years are $427,500,832, as shown in the last figure of column F, therefore, 3.297 per cent of the payroll would provide the pension requirement. That covers the means of getting at the proportion of the payroll which should be laid aside to meet the pension, taking account of the discontinuances.

2523 The rest of the exhibit is intended to show how much reserve, per employee, the company should lay aside to meet the accrued liability, or, in the last column, the reserve expressed as a percentage of the salary. It is hardly necessary to explain columns J and K, as they speak for themselves. One reads "Accumulation of 3.297 per cent of payroll at middle of year", because the valuations are mid-year valuations and are not yearly valuations. The other columns speak for themselves. It shows in column M that 1.65 per cent was required from the first year of salary to be accumulated, 6.56 per cent in the second year, and so on all the way down.

In my explanation I referred to the average annual salary of the group entering at the age 33 to 37, or a central age of 35, as being $2,700. That is because under the pension plan of the Western Electric Company it is the salary for the last ten years of service. It was not because that is the aver-
2524 age salary throughout all the years of service.

The figure of $7,085.14 at the bottom of column L is the middle of the year figure. There must be added to that figure one-half year's interest and one-half year's contribution from the company, so as to bring it to the end of the twenty-eighth year. If that is done, and the result divided by 1,908, the result is that it becomes $7,386 against $7,389, a difference which is entirely negligible.

I made calculations similar to those set out on Exhibit A-136 for other employees of the Western Electric Company by groups of ages at entry.

The instrument identified as Plaintiff's Exhibit A-137 was prepared under my direction and supervision. It shows
2525 the percentages which the company should have laid aside, based on the statistics as of March 31, 1931, for the groups of men and women according to the groups of age of entry which were used in the calculations. These are by groups of age at entry which I referred to before. The instruments identified as Plaintiff's Exhibits A-138 and A-139, showing, first as to men and second as to women, the 1931 pension reserve factors expressed as percentages of annual

salaries of employees at the various ages of entry, were prepared under my direction and supervision.

Exhibit A-138 shows the percentage reserve factors for each age of entry and for each year of service, interpolated from the results shown for A-137; that is, for the 7 groups which were prepared, usually by quinquennial ages at
2526 entry.

If you refer under age 35 in Exhibit A-138, you will find a percentage corresponding to that appearing in column M on Exhibit A-136, carried to a smaller figure or decimal.

I have calculated the accrued liability on active employees of the Western Electric Company as of March 31, 1931, both with respect to men and women employees, by applying the factors found in Exhibits A-138 and A-139 to the payroll for that year. I have tabulated the result of these calculations in these three exhibits, identified as Exhibits A-140, in two sheets, A-141 and A-142. These exhibits were prepared under my supervision and direction from the records of the Western Electric Company.

2527 Exhibit A-142 shows the total pension liability of the Western Electric Company, including those who are now pensioners, as of March 31, 1931. The total amount so arrived at on that exhibit is $57,768,000. In this Exhibit A-142, I have arrived at a summary of the total pension liability of the Western Electric Company as of March, 1931.

I then proceed to obtain the percentage of contribution, both as to men and women, applicable through all of the ages at entry combined. Exhibits A-143 and A-144 were prepared under my supervision and direction. They show the method of obtaining the percentage of contribution applicable to all ages combined. Prior to that time we had it for certain individual ages. In column A appears the aggregate
2528 annual salary under 46 years of age of entry, and under the retirement age. It is not taken beyond 45, because they are not entitled to a pension. In the next appears the percentage which has already been determined by the method outlined, and the multiplication of A and B gives the amount of contribution at each age. The total at the foot is the contribution for all ages.

The reading matter which appears at the bottom of Exhibit A-143 below the two summaries under columns A and C, explains itself.

The two exhibits identified as A-145 and A-146 were prepared under my supervision and direction from the Western's record. They show the pension reserve for accrued liability as of December 31, 1930, and also as of December 31, 1931.

These exhibits are self-explanatory, except the lower
2529 part of Exhibit A-146. In that exhibit (A-146), I found it desirable to make a certain adjustment, because of the changing conditions which applied to 1931. First of all, there was an adjustment to the normal salary scale. The percentage of 3.49 which appeared at the foot of that last exhibit for men was obtained from the full time salary scale effective as of March 31, 1931, but the actual payroll for 1931 was below normal due to the shorter working hours. This condition I assumed to be temporary, and not likely to affect the amount of the pension becoming payable, and so, accordingly, an adjustment of the payroll was made so that the percentage of 3.49 was applied to the normal scale in order to obtain the company's contribution. It seemed also desirable to make an adjustment of the payroll on account of the lower continuance rates, or to put it another way, the larger number of resignations, either voluntary, or involuntary, occurring part of the year 1931. As you will remember, the continuance rates were made up for the six years including March 31,
1931, but during part of 1931, the continuance rates were
2530 lower than the six-year average. The payroll was, therefore, reduced by the amount of the salary estimated to have been paid in 1931 to those who withdrew in excess of the number expected by these continuance rates.

There also was some adjustment made with respect to reserve liability for 1931; as the withdrawal rates in 1931 were in excess of the 1925-1931 rates, there was a release in the reserve on account of past service. Some of this, of course, will be offset by rehiring of men who will be entitled to credit on account of service which they had before leaving the service of the company, and after making the calculation

and considering all of the factors involved, I came to the conclusion that I should use one-half of the reserve released, deducting that from the accrued liability.

In determining the reserve released, I first found how many would have been in the service at the end of 1931 if the continuance rates for 1925 to 1931 had lasted. I then found out how many were in service and the difference were those
2531 who had left the service in excess of those assumed in the calculation, and I applied to this excess number the proper reserve factors, which gave me the total amount of the reserve which might be released. I used one-half of that. One reason which may be mentioned, I assumed, naturally, that those who did leave were those who were a comparatively short time in the service, and were probably making less salary, and would leave anyhow.

In my judgment as an actuary, this reserve calculation is a fair and just method in arriving at what should be released from the reserve for 1931.

The instrument identified as Exhibit A-147 shows the accumulation of the pension fund of the Western Electric Company for each of the years 1922 to 1931, and for that entire period, with the contribution percentage on the basis of 1931 census adjusted for distribution by sex and age at entry.

This exhibit was prepared under my supervision. The
2532 principal purpose of this exhibit is to show that the percentages obtained by me in the previous exhibits and the total amount of the liability comes reasonably close to the figures obtained by previous calculation. If one starts with the reserve at the end of the year, or the accrued liability, adds to that the contribution by the company, adds the interest and deducts the pension payment, the amount at the end of the year should be approximately the reserve for that year.

Now, with this explanation, I would like to go over one or
2533 two of the columns. In the first column there appears the annual payroll. To that has been added the percentage which the company should contribute, based on the statistics of the company prepared as already stated by me.

That figure for 1931 was 3.45. It has been adjusted for each of the preceding years, running from 3.48 to 3.51, these very minor adjustments being made because there was a slightly different distribution by sex and by age of entry. By multiplying the annual payroll by these percentages, the contribution which the company should make on these assumptions appears in column C. The interest is then added, which appears in D, the pension payments are deducted, which appear in E, resulting in F, the net additions. That, added to the fund, gives the assumed reserve at the end of the next year. That has been followed down throughout, and it will be noted that at the end of 1931, by the yearly process, the fund is $59,027,000. In the column of computed reserves, which I made as of the end of the year, it was $60,139,000, a comparatively small difference, especially when an adjustment was made to provide for the lower continuation rates, which I have already explained. As you will remember, I took one-
half of the reserve. If I had taken two-thirds, the
2534 amount would have been practically identical.

The amounts included in column C of Exhibit A-147 opposite each of the years 1923 to 1931 represent the amounts which, in my judgment and opinion as an actuary, should have been contributed by the Western Electric Company in each of these years under this pension plan.

So far as I can determine, I have not included in the annual payroll figure set out in column A of Exhibit A-147 any portion of the payroll for the Supply or Engineering Departments of the Western Electric Company. I asked the question directly of Mr. Burgess, the Chief Statistician of the company, whether any of the figures which he furnished me in connection with the payroll contained the figures for the Supply and Engineering Departments. He assured me that they were not included, and in the various work which I have done, and my assistants, we have found no evidence whatever that they were included.

The instrument identified as Exhibit A-148 was pre-
2535 pared under my supervision and direction. It shows for the years 1912 to 1922 the same character of information as appears for the period 1923 to 1931 on Exhibit A-147.

It was prepared by the use of the same general method which I used in the preparation of Exhibit A-147. I have prepared a statement in exhibit form, which has been identified as Exhibit A-149, which shows how I arrived at the figure $3,880,000 appearing in the top line of column H, under the heading "Computed Reserves", in this Exhibit A-148. The reserve factors were obtained in the same general way as those appearing in Exhibit A-136; that is, they were based on the continuance and salary rates observed at the time.

2536 The figure $17,600,000 shown on the last line under column H of Exhibit A-148, was prepared in the same general way as the Exhibit A-136 indicates, and also the Exhibit A-149, based on the salary scales and the continuance rates for the years prior to 1923.

"Q. According to Exhibit A-148, am I to understand that the contributions required by the company are shown in column C for each year 1912 to 1922?

"A. That is my judgment, after the various calculations, and in fact proof is shown in column G that these amount to a very small sum in addition to the calculation of the reserves as of the 31st of December, 1922."

I have in the courtroom now, so that defendants' counsel may inspect them, the work sheets which I have used in compiling these several exhibits, and also the data from the Western Electric Company which was used in the preparation of these exhibits.

(Plaintiff offered in evidence Exhibits A-130 to A-149, both inclusive, identified during the course of Dr. Hunter's direct examination. Ruling reserved.)

2537 CHARLES A. HEISS, called as a witness on behalf of the plaintiff, having first been duly sworn, testified as follows:

Direct Examination by Mr. Blackman.

May 16, 1932.

I testified at the first trial of this case about two years ago. I was called by the defendant, City of Chicago. I was and am Comptroller of the American Telephone and
2538 Telegraph Company. I have been Comptroller of the American Telephone and Telegraph Company approximately twelve years. I have been connected with the American Telephone and Telegraph Company approximately nineteen years. During all that time, I have been connected with the Comptroller's Department, first as an accountant for two years, two years as an Assistant Chief Accountant, about two years as Chief Accountant, one year as Assistant Comptroller, and the remainder of the time as Comptroller.

I am a graduate of the Bloomsburg State Normal School, Bloomsburg, Pennsylvania; I attended Franklin Marshall College, then attended the College of Political Sciences, and also took courses in Columbia Law School in Washington, D. C.
2539 There I specialized in accounting and economics, and later received an A. B. degree from George Washington University, and thereafter spent considerable time at the University of Michigan, specializing in accounting and economics and related subjects, and subsequently received a Master's degree from that institution.

Previous to my employment by the American Telephone and Telegraph Company, I was doing accounting work. I spent seven years with the Interstate Commerce Commission, part of the time in its Statistical Department, and later in its Bureau of Accounts as an examiner.

I receive monthly from the Personnel Department of our Company their approved expense bills and supporting statements. These are classified according to our classifications established by my department. We audit these bills and tabulate them for entry on our books, and also for the purpose of preparing for the Vice President in charge of
2540 the Personnel Department an administrative report. That gives me a very definite familiarity with the expenses of the Personnel Department. Then, in addition, representatives of my department and I have many conferences with the Personnel Department staff. We have numerous problems on which we work jointly, and in these ways we have become very familiar with the work and expenses of our Personnel Department.

This paper was prepared by my direction and under my supervision (paper marked Plaintiff's Exhibit A-150 for identification). It purports to show an allocation to the Chicago area of the fair proportion of the expenses of the Personnel Relations Department, a division of the Personnel Department, incurred in rendering license contract services during the years 1923 to 1931, inclusive. The general foundation for this exhibit is Exhibit 193, included in the deposition of Vice President Carter, taken recently in New York City.
2541 "Mr. Blackman: At this point, your Honor, I would like to present to the Court the deposition of Mr. Carter. I don't know whether you desire it read in, in question and answer form.
2542 "Judge Wilkerson: It may be considered as if it were read in full in the record, and may be abstracted with the testimony, in its regular place.

"Mr. Haight: That is quite all right.

"Mr. Blackman: Then, just to make the record correct, I will offer in evidence the deposition of Edwin F. Carter, called as a witness on behalf of the defendants, and examined pursuant to an order for examination issued by this Court."

(The deposition of Edwin F. Carter last above referred to was thereupon received in evidence, and made a part of the record.)

979 EDWIN F. CARTER, for defendants:

Direct Examination by Mr. Goldstein.

I reside at 1192 Park avenue, New York City; I am vice-president American Telephone and Telegraph Company. My work relates to the policies and practices affecting the employees and in addition in certain connecting company relations. I am in charge of the department of the American Telephone and Telegraph Company called Personnel Department. I have been the head of that department since May 1, 1930, and have been with that corporation since that time.

980 Prior to that I had no connection with it as a corporation, but was president of Ohio Bell from August, 1926, to May 1, 1930; before that I was vice president of Southwestern Bell located at St. Louis. I was made vice president Southwestern in spring of 1926; prior to that I was general commercial manager from spring of 1921; prior to that I was general manager for that company for the State of Texas; prior to that, general manager for Kansas. I entered the employ of the old Bell Telephone Company of Missouri at St. Louis in June, 1900; I have been employed with the Bell System since that time, but there was an intermission in my service of something between two and three years.

The Personnel Department was organized as it now
981 stands by Mr. E. K. Hall in 1920 or 1921. There has been some change in the functions of the department since that time. Some part of the work has been transferred to another department. Under Mr. Hall's administration, department had a great deal to do with public relations. Since I have been connected with it, it has been confined to personnel and connecting company relations. Public relations I consider to be matters relating to policies and practices of the company as having to do with public attitude.

982 A great deal was done in the way of helping public relations through employee contact. The Bell System has

scattered throughout the United States some 300,000 employees. If the attitude of the employees is right toward the public, if they are courteous, if they are willing to accommodate, if their work is splendid, that all supplies good public relations, but my department has only that type of public relation work,—that is, we have nothing to do with advertising, institutional advertising and matters of that sort.

Taking the period prior to the time I came with the department. I am not familiar, however, with the character of public relation work done at the time. I haven't anybody in my department who I think would be familiar with it. Prior to the time I came with this department I was in the field as a
983 president of an Associated Company and as a vice president of another Associated Company; prior to that for some time as its general commercial manager, and I was during that time in contact with this department from the field side.

I don't know what was done by my department prior to 1930 covering the subject matter of public relations. Since I have been with the department, I have somewhere between 90 and 100 in the Benefit & Medical and between 35 and 40 in Personal Relations. That is about the number that I have had since January 1, 1930. There have been some small changes. I have not the chart showing the organization of my department. There are no charts of my department put together for the department as an entirety.

984 The expense of the Personnel Division of the department, plus the administration of the Benefit and Medical, plus the Benefit and Medical payments, plus the Service Pension Accruals, all that goes into the Expense Account, runs between ten hundred and fifty and eleven hundred thousand dollars a year.

I have not with me any compilation of such expenses. I am quite sure Mr. Heiss' department would have that.

I have a statement, however, here showing the departmental expenses for the period from 1923 to 1930. There are
985 two divisions of the department. The document which I

have before me which is the statement, is marked Defendants' Deposition Exhibit 193 for identification. This Exhibit 193 consisting of two sheets is entitled American Telephone and Telegraph Company Excluding Long Lines Department, apportionment of departmental expenses between (a) those related to the furnishing of license contract services, and (b) those comprising other expenses of the Company, years 1923-1930, "Benefit and Medical Department", was prepared by me with clerical assistants. The figures shown on page 1 were prepared in my office from records in my office. Column 1 is entitled "Total Department Expense"; column 4 is entitled "Amount not specifically allocated, apportioned on basis of study". All columns were prepared from records in my office.

Both sheets were prepared by me from records in my office.

987 The occasion for the preparation of these two sheets came as a result of a discussion with Mr. Heiss about a year ago, probably in March. Of course the figures for 1931 were subsequently added.

Referring to columns 4, 5 and 6, the figures from column 4 are taken from the departmental reports. The items are charged so that they can be taken right from the reports. The 80 per cent of the staff expense in the Benefit and Medical Department is that part of the time which very clearly is given to Associated Companies and Long Lines. Column 7 is the remainder in dollars. Column 8 is a percentage. Column 6 bearing the per cent and column 5 the amount of the total expense for each year 1923 to 1930 is allocated to license contracts because that expense represents the services clearly allocable to Long Lines and the Associated Companies. It is columns 5 and 6 that the 80 per cent produces. The services which I stated are clearly for each of the Licensee Companies and Long Lines embrace the general staff which is engaged in giving advice and assistance to the Associated Companies and to Long Lines in the administration of their benefit plan, in giving them information in regard to their

sickness experience, and the sickness experience of other companies, and in promoting health activities. They give all the health statistics; they have collected very valuable health statistics. That is the basis from which they start on approving health conditions. They compile the statistics of all companies in the Bell System, thereby exchanging information.

989 The 20 per cent is intended to cover the contact with Western Electric and with the Laboratories, which is perhaps not service directly rendered to the Associated Companies of the Long Lines, but the Associated Companies and the Long Lines benefit from that, so that it is making a clear division between the services rendered the Associated Companies and the Western Electric. The basis of the 80-20 division instead of some other ratio was the basis of reviewed work and the best judgment that could be applied to it. It was not on a time sheet basis, just a matter of judgment.

The number of employees of the Bell System to which all of this was applicable, has varied at different times. At the present time there are almost 300,000, there being 340,000

990 to 350,000 in the associated companies and the Long Lines, Western Electric and the Laboratories; something under 300,000 are in the associated companies and the Long Lines; there are between 15,000 and 16,000 in the Long Lines. That figure that I gave includes the employees of the General Department of American Telephone and Telegraph Company.

The number of employees in the different companies were taken into consideration in a general way only in determining the 80-20 per cent division. It was considered in this way: Whether or not some divisions would be out of line considering the number of employees, but the division of 80 and 20 was made on the basis of what the departments were doing in that work. The division 80 and 20 was made on the amount of work done and not according to the number of employees. The same kind of work is not done for the Western Electric as is done for the associated companies. The Western Electric has different problems. They are a factory, for example, We have an employees' representation plan which my department works with all the time. That is a plan where employee

representatives and management representatives sit down and discuss problems that affect management and affect employees, say such a problem as we have at the present time in the Division of Work, which means part time employment and reduces income for employees. We are in contact with
992 that all the time, watching the trend and the attitude of employees. I don't think the Western Electric has any such plan; at least, we have never had any contact with it.

I haven't the total amount of expense by year covered by that specific service, but I have the expense by departments. I haven't the amount of expense covered by that particular service which is only done for the licensee companies that is not kept. I don't think I could make up a statement with any degree of accuracy covering that. I could approximate it to determine what portion of my total amount put in for the 80 per cent would be represented by that expense. I don't know that I could go back as far as 1923, but I will attempt to prepare such a statement.

The employee representation plan I think was introduced in the Bell System early in 1919, so that that particular service covers each of the years 1923 to 1930.

993 I don't think of any specific work other than I have mentioned that has been done for Associated Companies and Long Lines that has not been done for Western Electric, other than that there is more consultation with Associated Companies than Long Lines.

On one of those sheets there is an item which is allocated 100 per cent.

I have been talking about the personal relations appearing on page 2, and my answers to your questions have been directed to that.

"General Staff Services, Benefit and Medical Dept." covers work for Western Electric and its subsidiaries and associated companies, including the Bell Telephone Laboratories. There is contact all through there, with all the companies of the System, including 195 Broadway.

I don't think that item covers the Bell Securities Com-
995 pany as I don't believe it has any payroll employees. That

item does not cover Graybar for any year. I apportioned the expense of general staff for 1923-30 on the basis of 80-20, which resulted from a study and review of work done, contact with all companies, and is my best estimate of that part of the work that can be directly allocated. The 80 per cent to associated companies and the Long Lines.

I have available data in my department of the number of employees of the associated companies, Long Lines, Western Electric and its subsidiaries, 195 Broadway, Bell Telephone Laboratories, for each of the years with whom my department has contact. I will prepare such a statement.

The staff of the Medical Department shows the sickness
996 records of the companies and tabulates those studies then and reports back the sickness experience to all of the companies. It is the Statistical Division of the Benefit Department. They also give detailed information to the associated companies on request and discuss statistical work with the associated companies. They also give the detailed information on request and voluntarily to the Western Electric and its subsidiaries.

As regards this division, everything that is done is done for the entire Bell System. I am not sure whether the statistics cover the entire System. I will have to refresh my recollection. The reports are in my department.

998 Referring now to the Benefit Division,—it administers the Benefit Plan of the General Departments, American Telephone and Telegraph Company, except Long Lines. Long Lines has its own Committee on Benefit. The Benefit Department is confined exclusively to the General Department. The Third Division is the Medical Division, that is the medical course given to employees of the General Department. That is not the Medical Department. The Medical Department may give medical attention to an employee of Western Electric or an employee of Long Lines or an employee of the associated companies, but that would be charged to that company whose employee receives the medical attention. That is the figure for the services to the General Department for which no charge is made. But if medical attention is given

to employees of associated companies or the Long Lines or the Western Electric a charge is made to the Company.

999 The Fourth Division is benefit payments. Benefit payments cover sickness and death benefits, service pension accruals of the employees of the General Department, which relates to the American Company only. It applies to the General Department. The 80 per cent of the $43,587 in column 4 applies to staff and is applicable to license contract. For the remainder of these figures there are no percentages. That was all determined by Mr. Heiss. It was the over-all picture that gave him a percentage on those figures.

I did not make that allocation relating to the $24,424 in column (4), it having been determined by somebody else.

1001 There are some items which you can now and then specifically charge. In the column "Total (4)" is the total not specifically allocated. Then that is allocated on the basis of 80 and 20. The allocation begins with column 5. The general staff has been allocated on the basis of 80 and 20 per cent. There is no allocation of the figures in column 4 for the Divisions of Benefit Medical and Benefit Payments.

Referring to page 2, there are four subdivisions,—Administration, Personnel, Public Relations and Special Training under Personnel Relations. Administration represents cost of my office, it being engaged in the Administration Work of the Department, in conference and counsel with the associated companies and the Long Lines Department on all matters affecting employees. It also covers some, but very little, consultation work done with the employees of Western Electric and its subsidiaries. It also covers consultation work with employees of 195 Broadway, Bell Laboratories and Long Lines. My statements apply to the work done by the department before I came with the department. The work of the

1002 Administration Division I had contact with when I was in the field, and my own idea is that conditions are about the same now as they were before I came with the Department.

The Personnel Division has contact with the associated

companies and Long Lines on the administration of employees' representation plan, on the administration of employees thrift plan, a contact with the personnel men of the associated companies and Long Lines in connection with their employee problems and following the general trend of labor conditions outside and inside the industry. That division does not do the same work for the Western Electric and its subsidiaries. That division's contact with the associated companies and Long Lines is different from their contact with Western Electric. It covers a different subject matter. That was the particular division I referred to when I mentioned employee representation and said that I did not think the Western Electric had an employee representation plan.

Apart from the representation feature, that division would have the same kind of contact with Western Electric and its subsidiaries, but they do not give the same amount of attention to the work. They give whatever attention is necessary to the work of Western Electric and its subsidiaries.

1004 Public Relations Division consists of a man and his secretary located in Cleveland, Ohio, the central part of the associated companies' territories. He has contact with the different connecting companies, with the state and national associations and he advises and plans with the associated companies and those only, because they are the only companies that have connecting companies and connecting company problems and connecting company matters. He has no contact with Long Lines nor with the Western Electric nor with the laboratories. Long Lines has no contact with the connecting companies. The traffic problems of con-

1005 necting companies are between the connecting companies and the associated companies, but the contacts cover long distance service. The connecting company can go over the Long Lines just as over the associated lines.

The state and national associations I referred to are organizations of so-called independent telephone companies. That work has been going on for years. I had very close contact with that division in Cleveland because it was located there.

My contact with that particular division was a little bit more intimate when I was in Cleveland than it is now. I think that division goes back to the year 1923, but I would have to check.

Special Training Division covers the work growing out of our relationship with the colleges. The Bell System employs a great many college graduates. This department has con-
tact with the colleges and universities and co-ordinates
1006 with the colleges on recruiting problems, keeps in touch
with the college graduates and follows their record after they enter the Bell System. They also follow the record of promising material other than college graduates, colleges such as the State Universities, the Eastern Universities, say Cornell and Princeton, Yale, Massachusetts Institute of Technology and schools of that character. That covers persons who would be likely employees for any and all portions of the Bell System. Western Electric and Bell Laboratories take a substantial number over the long run of college graduates.

Referring to column 6 and column 8, I will say again that all of this division is on the same basis, a study of the work done, a study of the contact with the associated companies and Long Lines and Western Electric and Bell Telephone Laboratories, and as a result the percentages appearing in column 6 is the percentage of the amount of time and effort of this division given to the associated companies and the
Long Lines.

1007 For the years prior to the time I came with the Depart-
ment, I made the allocations between the contract and the other services. When the allocation was made, I did not have the time sheets or records of the effort for each of the years 1923 to 1930 before me, but I knew what the departments were doing in those previous years. I knew that there had been no material change in the work of the department. I had the further knowledge that I was in the field, and in contact with this division in those years and also with the
other divisions.

1008 Colonel Rees is at the head of the special training di-
vision that deals with the colleges and universities, and I was in frequent contact with him in the field, especially in

Cleveland. There are two universities in Cleveland, and I was in contact with Colonel Rees in college employment matters right up to the time that I came here. While I was in the field I talked with him on this particular subject matter. That did not involve also the question of time and efforts spent in connection with likely candidates for Western Electric and its subsidiaries; so that all my contact was with reference to the amount of work and effort in connection with candidates who would be likely employees for the associated companies. I have reviewed since I have been here, with Colonel Rees, the work of those years. He is with my department now and he knows the activities of that particular division prior to the time when I came with the department.

I don't know how many men were employed in the Special Training Division for the year 1929. Colonel Rees has
1009 two assistants stationed here, at 195 Broadway. He also has perhaps three or four clerical workers. The total expense of the Special Training Division for the year 1930 was $91,131; 1929, $89,109.

The work done in 1930 by that division was with the universities, associated companies, Western Electric and the Laboratories. That division maintains contact with the colleges and universities all through the year by traveling and by correspondence. I think we have a complete record of all college employees. The recruiting is done in this way: There may be two or three associated companies and the Western Electric recruiting at one university, but, say, for example, the Ohio Bell Telephone would not come on here in the East
1010 and recruit. If a likely candidate was found in the East that would like to go to Ohio, that application would be referred to Ohio, so that the recruiting is done during a certain period at the universities all over the country. Western Electric recruiting is done in a greater number of universities but not in all of them. Long Lines may recruit any number. Recruiting for a particular associated company is not restricted to its territory. It may go out of its territory and may go to an adjoining state. But it is a more restricted territory than the Western Electric and Long Lines.

Cross-Examination by Mr. Blackman.

1011 The Bell System, including Western Electric and Bell Telephone Laboratories, has now between 340,000 and 350,000 employees. The employees of the associated companies and Long Lines are daily in contact with the public. The Bell System requires an organization of high productivity and a great deal over and above that, an organization of men and women of good citizenship who have the right attitude toward their company and toward their work and toward one another and toward the public, because without that this great system cannot succeed.

The endeavor to obtain it is applied along many different lines. The training of employees goes on daily, usually handled by the supervisory organization. The securing of the right type of employee begins with the time that employee is selected and placed; it carries on through with his promotion, securing the right attitude, which is determined pretty much by whether the employee is fairly treated, whether his wages are fair, whether his working conditions are good. The efficiency is somewhat affected by his own mental attitude. He should be reasonably thrifty to be a good citizen; he should be relieved in so far as it is practical to do so, of that type of worry which destroys his efficiency, so that in addition to what the line organization does below and in addition to the help that any personal staff, working in connection with the line organization and helping obtain the right material, and helping to train that material, and helping to place that material in the right place, there are many other things that can be done that can add to the citizenship and character of the employee.

Some of those things, for example, are the employee thrift plans. The company does not require an employee to save, but it makes it easy for them to save, and the saving is entirely at the employee's discretion, yet, as I recall, in the year 1930 there were 80 per cent of the employees of the Bell System using one or more of the company's savings plans.

The employees' benefit and pension plan is looked upon as

an aid in securing the right type of men and women and holding that right type of men and women in the organization.

1013 To a utility operating all over the United States, it is especially important that its employees are that type of employee, that they are courteous and that they are considerate, accommodating as well as efficient.

On top of that general administration of the business, there are these things which I mentioned which are over and above technical efficiency, and this department which I head is interested in improving the organization along those lines as well as the lines of technical performance.

The activities of the various divisions of my department are devoted in one way or another to promoting those objects that I have mentioned, except the connecting companies, of the small public relations, and that is promoted by the relationships with the connecting companies of the Bell System.

There are now in the associated companies, the General Department and the Long Lines, about 295,000; 16,000 in Long Lines; small number, comparatively, in the Gen-
1014 eral Department; about 275,000 in the Associated Companies; in Western Electric, 40,000 to 45,000; Bell Laboratories something over 5,000.

Column 8 on the exhibit I have mentioned, shows the percentage of work done by these divisions which we cannot say can be definitely and directly allocated to the associated company and Long Lines. The figures in column 6, ranging from 80 to 100 per cent, can be directly allocated. The associated companies and the Long Lines benefit from all the work done by my department. I cannot think of anything we do that would be significant in amount that is not in the
1015 end directed to the benefit of the associated companies or Long Lines.

Annual reports American Telephone and Telegraph Company for years 1918 and 1919 to the stockholders offered in evidence by defendants as Defendants' Deposition Exhibits 50-A and 50-B, respectively, to which objection was made by plaintiff for irrelevancy, incompetency and immateriality.

EDWIN F. CARTER, recalled:

1028 *Re-direct Examination by Mr. Goldstein.*

In connection with the number of employes listed under the column of Western Electric Company, its subsidiary E. R. P. I. was included and E. R. P. I. only.

I don't know whether the Graybar Company from 1926 to 1928 had an Employes' Benefit Fund. Assuming that the Graybar Company had the benefit plan and was wholly owned by Western Electric, they would have the same access to my department as the Western Electric would.

In my figures relating to Western Electric shown on Defendants' Exhibit 195, I did not include any of the employes of Graybar. I don't know the number of employes of Graybar from 1926 to 1929.

My figures under Western Electric do not include International Western Electric employes.

To my recollection, there was practically no contact by my department with the employes of International Western Electric from 1923 to 1925, and I am not sure whether services were rendered to it, for I was not here at that time. To the best of my knowledge no services were rendered.

Column entitled "Associated Companies" only includes employes of Associated Companies located in the United States. We have contact with the employes of the Bell Telephone Company of Canada. We have no contract with the North Electric. I don't know how many there are there but I will furnish a statement showing that we have never furnished any services to the employes of the Northern Electric.

1033 Plaintiff states that the employes of the Graybar Company for the years 1926, 1927 and 1928 are as follows:

12/31/1926	2110
12/31/1927	1917
12/31/1928	1972

Plaintiff offers in evidence Defendants' Deposition Exhibit 193, to which defendant objected on the ground not proper and further on the ground of incompetency, irrelevancy and immateriality.

ARTHUR HUNTER, recalled as a witness on behalf of the plaintiff, having been previously duly sworn, further testified as follows:

2545 *Cross-Examination by Mr. Goldstein.*

May 17, 1932.

2546 It would not make any difference in my calculations whether I took 1 per cent of the average annual salary for the last 10 years, or 1 per cent of the average annual salary for the 10 consecutive years in which the highest rate of salary was paid, because they were the same under present conditions. I took that condition directly from the statistics, and, therefore, it did not make any difference which interpretation I used.

I took into account in my calculations the factor of
2547 the bridging of breaks in service to the extent that the statistics showed the experience; the bridging of breaks was followed exactly as it occurred.

I stated that an industrial corporation setting up its own pension fund would have a factor of risk which the insurance companies would not take into account in their plan; that is, the factor of discontinuance, which happens voluntarily or involuntarily during the period before the pension becomes due. I mean discontinuance for causes other than death. The insurance companies do not take into account in determining the rate under their plan the voluntary or involuntary withdrawals for causes other than death.

2548 There are a number of different forms which life insurance companies issue. In the question of life insurance, the surrender values paid take care of the factor of discontinuance. In the case of the usual type of annuity, provision is also made so that the prospective annuitant
2549 gets value for his money if he cannot continue. The usual practice is to provide that if, for example, the annuity were deferred for 30 years and he was paying it by annual premiums, if he dropped it at the end of 15 years the

annuity would be reduced one-half, payable at the same time as the original annuity.

There are a number of group annuity contracts. The one which is probably the most popular does not provide for a credit back to the employer for a portion of the premium in case the employee withdraws from the service; it provides that each year the employer will purchase a single premium annuity of the specified amount payable at the time of the pension. That may or may not remain the property of the employee if he should leave, either voluntarily or involuntarily. If the employee withdraws from the service, the employer gets credit for it by means of some surrender value or otherwise.

2550

In order to determine the amount of the pension under the Western Electric Company's plan, it is necessary, first, to get the wage scale at entry, and, second, to get the salary progress to the date when the pension will become due. For the purpose of my study as of March 31, 1931, I accepted the company's experience on both of those factors. If either the wage scale or the salary progress were varied subsequent to March 31, 1931, so that the wage scale for all classes were lower, or the salary progress was narrower in range than the experience prior to that date, the reserve as of March 31, 1931, would either have become excessive or be available, in part, for release. If the turnover were greater or the continuances lower than the experience for the period 1923 to 1931, the reserve as of that date would likewise become excessive or be available, in part, for release. The insurance companies under their plan make no allowance for any change in wage scale or change in salary progress; the plan is totally different.

2551

2553 If the experience subsequent to 1931 were of the character which has just been described, whether the amount to be put into the pension fund each year out of current earnings would have been less would depend, of course, on each one of these factors and their relation with one another. I cannot say that it would have been less or not, because I do

not know in what way these factors might relate into or with one another.

A lower continuance rate would have provided for a smaller amount to be put into the fund, and a lower wage scale
2554 would also have had that effect; it might have required as large a percentage, but in amount it would have been less. A slower salary progress would have resulted in a smaller amount in the fund. If there were a deficiency in the reserve at any time from 1923 to 1931, the amount to be released as of March 31, 1931, would tend to make up that deficiency. I made an adjustment in 1931 for the period from March 31 to December 31 for the factors which I found had varied from the normal factors which were used in my study as of March 31, 1931. Turning to Exhibit A-146, I took into account as of December 31, 1931, in so far as the reserve on March 31 of that year was concerned, the effect of the lower continuance rate.

2555 I did not take into account in my calculations any other factor of variance between the normal which I used for my study as of March 31 than the low continuance rate in so far as it affects the reserve on March 31, 1931. I did not state that there was a lower wage scale for the period from March 31, 1931, to December 31, 1931; there were shorter working hours.

2556 "Q. Now, what would be the effect—or what is the effect of the shorter working hours on the wage scale that you would use in connection with your calculations, that is, if there were shorter working hours for the period from March 31 to December 31, 1931, than there were from—during the period 1926 to 1931, how did—or what effect would that have on the wage scale which you had assumed as normal in connection with your study as of March 31, 1931?

"A. I am not sure that I understand such a long question, but I take it that the actual payments received by employees would be less than in previous years when they were working on full salary, and I accordingly made an adjustment therefor."

In determining whether the reserve as of March 31, 1931,

was available for release, I took into account all the factors which then appeared to me to meet the case and then I used my judgment, as I mentioned, in saying that one-half of the reserve released I assumed should be deducted from the
2557 reserve as calculated at December 31, 1931. I should like to add to that that if I deducted four-fifths instead of one-half, it still would have come within the amount which appeared in the next to the last column, from accumulating the contributions there stated. I did not take into account either a lower wage scale or a slower salary progress; it was based on the conditions as they then existed. The other factors were taken into account in the other two calculations which I had made and which I referred to. These other
2558 two calculations were concerned with the contribution of the company, which naturally enters into the reserve requirements. That is, the contribution of the company to take care of the reserve requirement of December 31, 1931. Following this progress which I endeavored to explain, the reserve at the end of one year, to which is added the company's contribution, plus the interest required, minus the pension payments, should be at the end of the time the following year's reserve. I examined figures for the period from January 1, 1932, to March 31, 1932, and checked the conditions for the three months of this year as compared to 1931; I took the year from March 31, 1931, to March 31, 1932.

I have no figure comparable to the figure shown in
2559 A-146 extended to March 31, 1932. I made no observations or calculations for the first three months of 1932 to determine whether the continuance rate was lower or higher in the first three months of 1932 than from March 31, 1931, to December 31, 1931; that would seem to me to be rather absurd. In making the calculations in connection with the low continuance rate, we took account of the year from March 31, 1931, to March 31, 1932, in determining the continuance rate which we used in connection with the pension reserve as of December 31, 1931. I did not give a statement which had the pension reserve as of March 31, 1932, because that was
2560 not called for; I was asked to prepare it year by year

and not according to sections of years. As all the censuses were made as of March 31 in each year, naturally I did the same thing for 1932, so as to have a complete year in connection with the census. Speaking from memory, my impression is that from about October, 1931, there were no discontinuances. In other words, the company put the force on shorter working hours and did not dispense with the services of any of them, or practically any of them, so that the continuance rates from January to March, 1932, did not exist at all; it would rather be the opposite of what had been provided in the calculations. In other words, I had provided
2561 for a discontinuance rate, and, on account of the economic conditions, there was no such discontinuance rate. I stated that I had found there was a lower wage scale due to the factor of shorter working time, but I considered it temporary. In determining the cost, it did not seem to me to be advisable to take that into account, because under the custom of the company the pension is based on the ten years in which the wages are highest. Therefore, it was quite within the function of the company to disregard the years, say, of 1930, 1931, or 1932, and base the pension solely on the 10 years prior to the present economic conditions and prior to the decrease in the actual wages. A number of
2562 the questions asked of me have not taken into account a very serious factor which has largely nullified those questions. They have assumed that there would be a smaller wage scale and that in the future the continuance rates would be very much lower; that is, the dismissals would be higher. But what actually happens is that if the company came to what might be called a static condition where there would be about the same force for a number of years to come, there would be a very distinctly lower rate of dismissal and a much higher continuance rate. That is to say that any man who held a job would not be willing to let it go, because it would be the most valuable thing he had, and, therefore, there would be more men remain in the service to get the pension, and, therefore, the cost of the pension would be a higher proportion of the wage scale, and might cost even distinctly more

money than under conditions where there was a large labor turnover.

It might or might not have the effect of releasing a part of the reserve as of March 31, 1931. That is something that no one can tell, because again it would depend on the
2563 three factors and principally on the question of how large that continuance rate might be.

(Statement given to defendants by the Western Electric Company, entitled "Number of Employees of the Western Electric Company, 1916 to 1930" marked for identification as Defendants' Exhibit D-97.)

2574 *Re-direct Examination by Mr. Thompson.*

The continuance rates which I use in the calculations contained in my exhibits are based on the company's actual experience covering a long period of time, and as shown by carefully compiled census data for the years 1925, 1927, 1929, and 1931. I had no regular census data of the company's employees subsequent to March 31, 1931; I had the number of employees on the payroll, but no regular census.

I found that subsequent to the 31st of March, 1931, there had been what I thought was a temporary condition that
2575 should be allowed for in my calculations. I did two things: first, I adjusted the payroll for 1931 on account of this lower continuance rate, and then I made an adjustment on account of reserve to the extent of one-half of $3,100,000. In my opinion that was the proper and accurate amount to adjust the reserve in order to care for the conditions as I found them.

If the company's labor turnover becomes less because of less industrial activity, that results in a reduced force of employees as compared to the time when the activity of the company was higher. It also results in and I found from the experience of the company that subsequent to October of 1931 there had practically been no discontinuance. Even if I should premise a continuance of this situation, it

2576 operates towards higher continuance rates, and, therefore, a higher percentage of payroll than I have found in my calculations.

The questions regarding life insurance companies and the comparison made between them and an industrial pension scheme of this kind might be misunderstood. The life insurance companies naturally must charge more, because they do not take account of the number who discontinue, except by giving a value to those who do discontinue. Accordingly the charge for a pension fund, a pension or an annuity, must be larger for the life insurance companies than it would be by an industrial corporation, which took account in advance of the discontinuances which it expected to have and for which it has applied no value.

Cross-Examination by Mr. Goldstein.

2577 The life insurance companies' plans are predicated not on a wage scale, but on a definite amount that provision is made for. That is, paying the pension on the salary which the man has at that time and which would not be changed in the future or by reason of any reductions. There was a substantial reduction in the number of employees as of March 31, 1932, as compared to March 31, 1931; I could not remember just what it was.

(Plaintiff again offered in evidence exhibits marked for identification, A-130 to A-149, both inclusive. Admitted.)

CHARLES A. HEISS, recalled as a witness on behalf of the plaintiff, having been previously duly sworn, thereupon resumed the stand and further testified as follows:

Direct Examination (Continued) by Mr. Blackman.

May 17, 1932.

2579 The figures in column 1 of Plaintiff's Exhibit A-150 are taken directly and without change from column 4 of Exhibit 193. The figures in column 2 are taken directly and without change from Exhibit 193, from the column headed "Other". The figures in column 3 are computations made by me. The figure 10 appearing in the first portion of that column is a percentage figure developed by me. The figure 10 is to be used to eliminate from column 2 that portion of the expense which should be excluded as applicable to 2580 non-telephone activities. The second half of column 3 shows merely the dollar figures obtained by applying the 10 per cent figure to the figures in the preceding column.

The figures in column 4 (there is very little difference between the amounts stated in column 3 and the amounts stated in column 2) are just the remainder after deducting column 3 from column 2.

Column 5 was taken directly and without change from Exhibit 193. They are the amounts which Mr. Carter, in that exhibit, allocated directly to the license contract.

2581 Column 6 is the sum of the figures in column 4 and column 5. That is, column 6 purports to show the amounts which Mr. Carter allocated directly to the license contract, plus the proportion of the sums which he set up as indirect costs.

Column 7 is an allocation to the Long Lines of its fair proportion of the amount stated in column 6. The figures in the left hand section of column 7 are percentages. The figures in the right hand section are amounts computed by applying the percentages just mentioned to column 6. The percentage, let us say, for the year 1923 of 3.5 represents the ratio of the

Long Lines employees to the total employees of the associate companies, including the Bell of Canada and the Long Lines. I took employees for the reason that the work
2582 of Mr. Carter—or rather of the Personnel Department—particularly the work which we are here discussing, that is, administration, personnel and special training, is all work which is in connection with employee relationships, and; therefore, in my opinion, the best basis for allocation to the Long Lines is the ratio of its employees to the total employees.

The other ratio of 5.08, in the line immediately below, is a composite ratio taking into consideration plant investment, employees, expenses and total revenues. I took a composite ratio for the purpose of allocating this particular type of work, that is, public relations work, to the Long Lines, for the reason that this public relations work is of a broad general character affecting all phases of the telephone business, principally the relations with our connecting companies, in matters of plant revenues, expenses and employees, and it seemed to me that a composite ratio which took into consideration all of those factors produced a fair and proper allocation. The 5.08 is, as I said, a ratio which does that.
2583 The application of these ratios to the figures immediately preceding gives you the figures in the right hand side of column 7. Then, deducting those figures from the figures in column 6 gives you what purports to be the amount to be allocated to the associate companies, including the Bell of Canada, but excluding the Long Lines. Having that
2584 figure, in column 8, to develop the fair share of that class of expense that should be allocated to the Chicago area of the Illinois Bell, I proceeded on the same basis as was followed in making an allocation to the Long Lines Department; that is, so far as the work of administration, personnel and special training is concerned, I used a ratio of employees; that is, comparing the employees of the Chicago area to the total employees of the associate companies, including the Bell of Canada, but excluding the Long Lines. For the year 1923, employees of the Chicago area were 7

per cent of the employees of the associate companies, including the Bell of Canada. Now, the amount in the right hand section of column 9 is merely the application of the percentage figure in column 9 to column 8. In connection with the public relations expense, I used a composite ratio made up of plant investment, employees, expenses and telephone revenues. That was made up in the same way as I have described, but including stations. That ratio was 6.6 of the plant investment, employees, expenses, revenues and stations of the associate companies and the Bell of Canada, and 6.6 of column 8 gives you the $5,002 appearing at the right hand of column 9. I used one additional factor, stations, in developing this ratio in column 9. I did not use stations in the
case of the Long Lines because the Long Lines had no
2585 stations, but I used them in the case of the allocation to
the Chicago area, because I wanted to bring into the picture all of the factors which should be considered an allocation affecting all of the phases an allocation of expenses affecting all phases of the business. And, therefore, I used this public relations factor, which is the one I am dealing with.

I have proceeded in precisely the same way in each of the years subsequent to 1923 as shown on this sheet. There is a small typographical error in the figures for the year 1925, in column 8. The amount of $13,914, appearing against public relations in column 8, should be $13,924, that is, $10 more; and that change affects the total in the same amount, making that
total in column 8 for the year 1925, $303,806. No other
2586 figures are affected by that. The amounts as carried
out are correct.

In my opinion, the methods which I have followed are proper to develop the results which I purport to show.

In my opinion, these figures in this last column to the right on the paper which I have been describing, Plaintiff's Exhibit A-150 for identification, are the minimum amounts of expense of the Personnel Department for the matters referred to, which should be allocated to the Chicago area of the Illinois Bell Telephone Company.

Mr. Carter, in his testimony, referred to a change which

had taken place in his department. That change took place May 1, 1923, so that practically throughout the period dealt with, the work of the department and the general character of its relations has been the same.

"Mr. Blackman: I offer the sheet in evidence as Exhibit A-150 for identification.

"Judge Wilkerson: Is the objection reserved?

2587 "Mr. Haight: Yes, if the Court please.

"Judge Wilkerson: The ruling is reserved."

This sheet (marked for identification Plaintiff's Exhibit A-151) was prepared at my direction and under my supervision. It is an allocation to the Chicago area of its fair proportion of expenses incurred through the years, expenses incurred by the benefit and medical section of the Personnel Department, in rendering license contract services.

The figures in the first column on this sheet came directly and without change from Exhibit 193, already referred to. Such figures as appear in the second column also came from Exhibit 193 directly without change. The figures

2588 in column 3 are computations made by me. The figure 10 appearing against General Staff—the figure 10 in the case of the year 1923—is the same percentage which I have already explained, used in Exhibit A-150.

The figure 5 is a percentage which I have computed and used to eliminate that part of the expense or cost incurred by the Benefit and Medical Department, which was not of benefit to the associate companies and the Long Lines Department. The percentage is made up by taking into consideration the amounts eliminated by each department which were not of benefit to the associate companies and the Long Lines.

For instance, Dr. Jewett made an elimination from his expense for work which was of benefit to other than the associate companies and the Long Lines. Mr. Gherardi, of the Department of Operation and Engineering, considered the matter; Mr. Page made an elimination; and other elimi-

2589 nations have been made of expense which is not of benefit to the associate companies and the Long Lines—for

work not of benefit to the associate companies and Long Lines; and I have taken all of those eliminations and have computed them for the departments as a whole, and the percentage for the departments as a whole which should be eliminated, was about 3.5 or 4 per cent; and in order that there might not be any question, in order that all contingencies might be covered, I have used a 5 per cent figure for making the elimination. That is, there are five or six so-called general departments of the American Telephone and Telegraph Company, such as Dr. Jewett's Department of Development and Research, Mr. Gherardi's Department of Operation and Engineering, and so forth.

This work, benefit and medical, which is shown on this sheet, is the benefit and medical in connection with those departments, and it is confined to those departments.

The three items, benefit, medical and benefit payments,
represent work done and expenses incurred in connec-
2590 tion with the several general departments in New York,
after excluding the Long Lines. What I have attempted to do here is to prorate these three items of expense on the same basis that the general expenses of the departments which they serve were prorated--on the same basis as the general expenses as a whole were prorated. And, in my opinion, that is a fair and proper way to proceed.

This sheet is carried through in the same manner in which I carried through the previous sheet, with the same column numbers. The figures in column 4 are the remainders after deducting column 3 from column 2.

This sheet is developed in the same way. The columns
2591 headed 3, 4, 5, 6, 7 and 8 on this sheet have the same
significance generally as they do on the preceding sheets: I might add that the amount in column 5 was taken directly, without change, from Exhibit 193. I have developed on this sheet the percentages in the same way as I did on Exhibit A-150. In my opinion, the figures shown in the last column to the right on this sheet show a minimum allocation to the Chicago area of the Illinois Bell Company of its fair share of the expenses shown in the first column to the right on

this sheet. I might add, as regards benefit, medical and benefit payments, Mr. Carter made no allocation, and the amount allocated is based on, or is according to the methods indicated in the notes at the foot of the sheet. That is,
2592 I made the allocation. I made it on the basis which I have just described. That is, the 5 per cent figure.

The figures for the year 1931 were not on Exhibit 193, and I therefore modify my statement already in the record that, in so far as 1931 is concerned, they were not on the exhibit which Mr. Carter introduced. I have added them here, and applied the same method of allocation as we used for the other years. I obtained these figures from the books of the Company, and I proceeded in precisely the same way as in previous years, with Mr. Carter's approval. Each of those years subsequent to 1923 is dealt with in the same manner in which I dealt with 1923.

2593 "Mr. Blackman: I offer this sheet, Plaintiff's Exhibit A-151 for identification, in evidence.

"Mr. Haight: May our objections be made at the conclusion of the cross-examination?

"Judge Wilkerson: Yes."

2594 This sheet, Plaintiff's Exhibit A-152 for identification, was prepared at my direction and under my supervision. The sheet is merely a summary of the two sheets just discussed. It brings together the amounts shown in column 4 of Exhibit 193, total expense incurred for personnel, benefit and medical relations, and shows in the next column the amounts thereof allocated to the Chicago area for each of the years 1923 to 1931, broken down as between expenditures, costs incurred in connection with personnel relations, and those incurred in connection with medical and benefit work. Those personnel relation services were services that were rendered to the Illinois Bell Company, or in part directly to the Illinois Bell Company. The benefit and medical was only an indirect service to the Illinois Bell Company.
2595 That was a service to the general departments, which were, in turn, serving the Illinois Bell.

"Mr. Blackman: I offer this sheet, Plaintiff's Exhibit A-152 for identification, in evidence.

"Mr. Haight: We make the same reservation."

This sheet, Plaintiff's Exhibit A-153 for identification, was prepared at my direction and under my supervision. It is an allocation to the Chicago area of its fair proportion of the public relation expenses incurred in rendering license contract services for the years 1923 to 1931, inclusive. I am familiar with the work shown on this sheet. The work is shown on this sheet divided into two parts. The first is described as "Representation of Companies before Federal Government and National Trade Organizations". That work started in 1924, and has continued throughout the period, until
2596 just recently there was a slight change in the organization of the work. The work represents, in part, representation of the companies before the Interstate Commerce Commission in the matter of obtaining from that body approvals to purchases of property, and is work which is done entirely for the associate companies. Another part of that section deals with relations with such national organizations as the United States Chamber of Commerce, large local chambers of commerce, the International Chamber of Commerce; relations with the Department of Commerce, census bureaus, and also such national organizations as the American Management Association, the American Society of Sales Executives, work done in the broad general interest of the business of the associate companies and the Long Lines, and stimulating good relations, finding out the problems which confront different types of industry, and so on.

The second section pertains to the development of telephone use in different types of business. Now, that is
2597 work done in connection with the survey and study of the telephone needs of various kinds of businesses and ways of meeting them. For instance, we consider the best type of telephone service for farmers, and different lines of business, in the most effective distribution of products, and so on. That work began in 1929.

The figures in column 1 are taken from our books and records. The figures in column 2 are taken directly and without change from our books. The ratios appearing in the left hand section of column 3 represent percentages based on the composite ratio of plant, employees, expenses and total tele-
2598 phone revenues; that is, the character of the representation of the companies before the Federal Government and national trade organizations is broad and general in character and affects all phases of the business, and in making the allocation a ratio was used which took into consideration that fact. In my opinion, that is the proper type of ratio to be used in making the allocation.

The ratio used for allocating to the Long Lines its fair share of the expenses of developing telephone use is revenue. That particular activity is developing revenue, and we have used a revenue ratio in making the allocation.

In the allocation to the Chicago area, we took into consideration the same factors: the representation of the companies before the Federal Government and national trade organizations was allocated by using the composite ratio just described.

The allocation of the second section of the work, developing telephone use, was made on the basis of revenue.

In my opinion, the figures shown in the last column to the right on this sheet are the minimum figures for the fair share of the Chicago area of the Illinois Bell Telephone Com-
2599 pany of the work and the expense shown on this sheet.

"Mr. Blackman: I offer Plaintiff's Exhibit A-153 for identification, in evidence."

This paper, Plaintiff's Exhibit A-154 for identification, was prepared at my direction and under my supervision. It purports to show an allocation to the Chicago area of its fair proportion of the Treasurer's Department expenses incurred in rendering license contract services during the years 1923 to 1931, inclusive.

"Mr. Blackman: I will offer in evidence the cross-examination of Mr. Blair-Smith in New York under the order of this Court for his examination.

"Judge Wilkerson: You may offer the rest of it, if you desire.

2600 "Mr. Haight: Yes.

"Mr. Blackman: I offer the cross.

"Judge Wilkerson: And at the request of counsel for the defendants, the remainder is put into the record, for convenience in this place, but really as part of the defendants' case.

"Mr. Blackman: All right, sir."

(The deposition of H. Blair-Smith last above referred to was accordingly received in evidence, and made a part of this record.)

366 HUGH BLAIR-SMITH, for defendants:

Direct Examination by Mr. Haight.

I reside at Englewood, New Jersey. I am treasurer of the American Telephone and Telegraph Company and have been for nearly ten years, my office being at 195 Broadway. I also have an office at Boston, Mass.

My department's work is divided into three main divisions —Administration, Stock and Financial. The Adminis-
367 tration Division is divided into Personnel, Office Services, including Mail Services and Stenographic Services. Stock Division is divided into Transfers and Registration, Bookkeeping and Dividend and Statistical Work.

There are two main divisions and then there are several subdivisions. The two main divisions are the transfer of stock and the records of stockholders, the issue of dividend checks and payment of dividends. That department also has charge of the registration and records of bonds outstanding. In other words, that department handles the issue and transfer of capital obligation and related records of the company.

The financial division is subdivided mainly into the work of the cashier, purchase and custody of securities and there is another division respecting verification of dividend bank accounts and paid interest coupons. My department does

about as much work for Long Lines as it does for associated companies, possibly a little more.

368 The assistant treasurer of American Telephone and Telegraph Company is the acting treasurer of Long Lines Department. It is not a division in my office, but it is necessary under the by laws of the company for an assistant treasurer to be the treasurer of Long Lines. Long Lines is separately handled from the other three divisions and that has been true ever since I have been treasurer. The same organization in respect to divisions has existed practically from 1923 to 1930, inclusive. In the administration division in 1930 we had about 106.

369 I am familiar with the articles appearing in the Bell Telephone Quarterly for October of each of the years 1924, 1926, 1928, 1929 and 1930 which were written by me.

371 In the middle of this summer (1931) we made a study of the number of employes of the different divisions for 1930: Administrative Division 106; Stock Division 198; Financial Division 55. I don't know during the same year how many men were in the Long Lines Treasurer's work.

372 The Treasurer of Long Lines is Mr. H. W. Roscoe. He has been in that position about a year. Mr. E. C. McAllister preceded him. I think 12 or 14 men work under Mr. Roscoe. During Mr. McAllister's time the number was fewer.

In the Administrative Division we have one bureau that is in charge of the development and improvement of department methods and preparations of instructions, analysis and research work necessary to advise associated companies in matters affecting treasury work, preparation of bulletins and letters advising associated companies of recommended practices and consultation by personal visits or correspondence of general treasury problems. There are 11 employes engaged in that work.

373 We have another bureau in charge of the development of treasury statistics, relations with bank commissioners on securities, special studies of finance and related questions, preparation of financial booklets and publications, special

financial correspondence, listings of securities on exchanges; there are 14 employes so engaged.

Another bureau, of study and analysis of the various operations, including the preparation of work reports and cost statements reflecting general operating results, selection and training of employes and other personnel activities. Twelve employes.

Then we have another bureau for the departmental budget cost statement; storage and distribution of office supplies, messenger service, archives, other general services relating to the work of the department as a whole; 18 employes.

Another bureau is in charge of the receipt and dispatch of mail, maintenance of correspondence files, and the storage and cremation of records; 23 employes.

Then we have a general stenographic service for the department; 28 employes. That is all the Administrative Division.

374 In the Stock Division we have one bureau charged with the issue, registration and transfer of the capital stock of the company; the issue, registration, exchange, conversion and redemption of bonds and the maintenance of records relating to the funded indebtedness of the company; the payment of bond interest, contacts with the company's security holders by correspondence, by telephone or in person; assistance to associated companies in the engraving and issue of securities. There are 82 employes in that bureau.

A second bureau is in charge of the maintenance of accounts of stockholders, issue and delivery of dividend checks, stockholders' statistics and reports, mailing of circulars and notices to stockholders; returns of information required by law at the source; tax information and reports. There are 83 employes so engaged.

Another bureau is engaged in handling subscriptions of the Bell System employes for stock to be paid for by assignment of dividends and maintenance of related records. Verification of all lists of completed payments by employes; 13 employes.

375 A fourth bureau is the office at Boston, which performs

mainly duties concerning transfer of stock and the payment of coupon interest and maturing obligations and does any other work that is required locally; 20 employes. That is all the work of the Stock Division.

The Financial Division has four main bureaus. The first one is engaged in the purchase and sale of temporary investment securities, custody of securities owned by the company, acceptance of subscriptions under the salary reduction provision of the employes' stock plan, for general department employes; safekeeping of Bell System and United States Government securities owned by employes and placed with the company by employes of the company for safekeeping; all related correspondence, records and reports. There are eight employes in that.

Another bureau, in charge of the receipt and disbursements of the company funds, including payrolls, verification of bank statements (except the dividend bank account), related correspondence, records, reports and similar activities for Bell Telephone Securities Company and 195 Broadway Corporation. That has 15 employes.

376 The next bureau, verification of dividend bank statement, placing and withdrawal of bank stop payment orders for dividend checks, verification of paid bond interest, coupons, related correspondence and records, preparation and cremation of records for paid bonds and coupons; 17 employes.

We then have the Bell Telephone Securities Section, which is engaged in the purchase of American Telephone shares under the plan to assist small investors throughout the country. Application and accounts of purchases in the New York office; all related records and correspondence; employes and miscellaneous purchases and sales of securities. That has 15 employes. That is all for the Financial Division. That is as of August 25, 1931.

On January 1st of each year we had—

Administration Division, 1923	31
Stock Division	220
Financial Division	61

I have a chart which shows the number of employes as of January first of each year with the Treasury Department for years 1923 to 1931, both inclusive, for each of the
377 three divisions and each of the bureaus of such division which said chart is offered in evidence as Defendant's Exhibit 5.

I have a chart which I use in my testimony in regard to the number of employes in the three principal divisions and in the principal bureaus thereof, which chart is offered in evidence as Defendants' Exhibit 6.

378 The character of the work in these various divisions and the various bureaus thereof has remained about the same during the years 1923 to date.

I have a document consisting of several typewritten sheets and dated April 30, 1931, generally with respect to expenditures by divisions from 1923 to 1930. It was prepared at about that time under the supervision of the assistant
379 treasurer, Van Cise. This statement was prepared for the comptroller and in preparing it we prepared it along the same lines that he had asked us to observe in the preparation of it, the purpose being to set forth, first, the minimum amount of expenses incurred in the Treasury Department which we felt was chargeable because of the license contract. The second basis was to add to those expenses the cost of security issues, extraordinary expenses that were incurred during the particular years 1923 to 1930, inclusive, and that is known as basis two.

The column entitled "Total Expenses" in the first page gives the total expenses of the General Department for each of those years. There is also included in that column "Unusual Security Issue Expenses." The next column is entitled "Charges to License Contract, Basis 1," which is the basis that I have previously described. We arrived at the figures opposite each year by taking the expenses of each division of the Treasury Department, starting with the Financial Division, and we included in the expenses chargeable under basis one to license contract, the following:

380 A. Handling the temporary investments.

B. Paying of salaries and the performance of keeping books and banking work for that part of General Department
381 operations which are devoted to license contract services under the theory that we were working on.

C. Making of advances to associated companies and the handling of their notes, and

D. Handling of General Department employes, stock subscriptions under the Employes Stock Plan.

We then took the stock division expenses and we have included the cost of issuing of stock to employes of the Bell System, under the Employes Stock Plan, and the handling of subscriptions payable by the assignment of dividends in the Employes Stock Bureau, which has been operating only in 1930. We made certain eliminations from those expenses, including all of the cost of handling that work in connection with the employes of Western Electric, of Bell Telephone Securities Co., of the 195 and 205 Broadway Corporations, of E. R. P. I. We eliminated 70% of the expenses attached to the work for employes of Bell Telephone Laboratories and 15% of the cost performed for employes of the General Department, American Telephone and Telegraph Company.

We eliminated those percentages. Next we took the
382 administrative expenses which appear on page 4, under the heading, "Allocation of Administrative Division Expenses." We took the expenses attaching to executive administration and methods work allocated to the financial and stock divisions and in turn allocated to license contract activities. Also the methods and development work in behalf of associated companies, and third, the cost of the Bell System Treasurers Conference, which was held in 1927, and on that basis we allocated the expenses as the expenses chargeable under license contract, Basis 1.

In handling the security issues it was necessary to organize a new division and to bring in a large number of additional employes. We have usually had to employ or rent additional space. I think we began in 1924 to use space that was outside of our own offices. In organizing the work we have necessarily taken quite a number of the regular employes of

the department and placed them in charge of the various activities and drawn in new people to perform the reg-
383 ular activities performed by those whom we had withdrawn to the stock issue. The costs that we have kept of our stock issues, and we have in our records kept those costs, are such as we have incurred in addition to the normal expenses of the department.

Those expenses of the various divisions, excluding the extraordinary expenses of the security issues, appear in the figures contained in those papers. They appear on page 2 and in the first column there is shown the expenses of the Financial Division, excluding the security issue expenses. On page 4 in the top table are shown the total expenses of the stock division, excluding security issue expenses, and at the bottom of that page are shown the total expenses of the Administration Division, excluding security issue expenses.

There is a large sheet entitled "American Telephone and Telegraph, Excluding Long Lines Department," (entitled Exhibit A, which is a summary of what has gone before.)
384 There are the various initials which constitute the key, the key being shown at the bottom of the sheet.

On page 2, referring to the distribution of Financial Division Expenses and the first column, in addition to salaries there goes in rent, stationery, telephone service, postage and stationery and other miscellaneous expenses. The same is true as to other divisions of the department in this exhibit.

Additional rent is included under "Expenses Charged to License Contract" as to Basis 2, but not as to Basis 1. When Basis 1 is employed in the figures relating to each of those three divisions rent is included in Exhibit A, specifically allocated "Other," column 3.

385 (Paper described by the witness is marked Defendants' Deposition Exhibit 7, for identification.)

My department includes among its employes those that receive the dividends from stock of licensee companies owned by American Telephone and Telegraph Company.

I believe the statements, charts and graphs in the following articles, prepared by me, are correct: Article in the

October, 1930, issue of Bell Telephone Quarterly, pages 250-261. Article in the October, 1929, issue of Bell Telephone Quarterly entitled "1929 Convertible Bond Offer of American Telephone and Telegraph Company," pages 316 to 327. Article in the October, 1928, issue of Bell Telephone Quarterly entitled "1928 Stock Offer of the American Telephone and Telegraph Company," pages 253-265. Article in the October, 1926, issue of Bell Telephone Quarterly entitled "1926 Stock Issue of the American Telephone and Telegraph Company," pages 253-265. Article in the October, 1924, issue of Bell Telephone Quarterly entitled "1924 Stock Issue of the American Telephone and Telegraph Company," pages 262-269.

(Articles by witness in various October issues of Bell Telephone Quarterly for the years above mentioned, 1924, 1926, 1928, 1929 and 1930, were marked for identification as Defendants' Deposition Exhibits 8, 9, 10, 11 and 12.)

Referring to the peak period mentioned in those various issues of the Bell Quarterly, we start out with a small number of extras and go up to the peak and gradually go down until we get rid of all of them. The total expenses in regard to each appear in Defendants' Deposition, Exhibit 7.

388 Another thing I want to explain is that some of these temporaries went into the regular organization to replace the permanents that went out and went into the stock organization. The number of employes at the peak issue of the stock work was as follows:

1924, 480
1926, 636
1928, 705
1929, 607
1930, 950

The total expenses with regard to each of these appear in Defendant's Exhibit 7.

(Mr. Blackman reserved right to make cross-examination of Mr. Blair-Smith later.)

907 HUGH BLAIR-SMITH, recalled:

Cross-Examination by Mr. Blackman.

The Treasury Department of American Telephone and Telegraph Company has the custody of the cash and the securities of the company. It receives and disburses the funds, providing financial services to the several general departments; this includes the payment of payrolls and expenses. It makes advances to the associated companies, invests the surplus cash on hand in short time securities so as to have it always liquid and available. It issues, transfers and registers the securities of the company, including the issue to the employees of stock under the employee stock plan, and it conducts financial research and development methods for improving practices in our own and in the offices of the associated treasurers. It issues letters and bulletins concerning those practices, and it also engages in personal consultations and in correspondence with the treasurers of the associated companies and their offices in specific questions.

During the period January 1, 1923, to December 31, 1931, my department obtained in the way of new financing $1,820,000,000. In that period the company has accumulated in undivided profits $293,000,000. As to what was done with the money,—first we advanced to the associated companies

$1,438,000,000, later taking their securities for that and 908 we now hold those securities. To the Long Lines Department of the company we advanced $306,000,000 for the construction of property. To the Western Electric Company we advanced $89,000,000. We added through advances to the Bell Telephone Securities Company, $4,000,000. We advanced to the 195 Broadway Corporation, which is the corporation owning the Headquarters Building, an additional $8,000,000 in connection with building operations, and we retired debt of the company to an amount of $133,000,000 and the balance of the money amounting to about $135,000,000 was added to the liquid funds of the company. We still have that, or we

had it January 1. That is the amount of liquid funds over and above the amount that we had on January 1, 1923.

During the period that we are talking about from 1923 to 1931, we had three issues of debentures, and we were concerned with five stock issues to stockholders, and one
909 issue of convertible bonds, to stockholders.

The three debenture issues do not involve as much detail as do the offers of securities to stockholders. These debenture issues were sold to syndicates and all in bulk, and the amount of work in connection with those,—take, for instance, the 1930 issue of $150,000,000,—that is done in a short period of time.

We first have to have what we call temporary bonds printed. These are delivered to the syndicate, and then we receive our money.

As soon as we can after that, we have definitive bonds prepared, and these definitive bonds, as soon as executed, are given in exchange for the temporary bonds. The bond forms, there are six, in this issue of $150,000,000 we had to issue altogether about 152,000 pieces.

In connection with stock issues which are made to the stockholders, we have a much more complicated operation. I should like to describe the 1930 issue to give you an idea of it.

At the time of the issue, there were 508,000 stockholders involved. It required that we send to each of these stockholders a notice telling him of the issue and describing its terms.

910 Then after the record date it was necessary for us to issue, and deliver to stockholders some 750,000 warrants evidencing their subscription rights. With these we sent another circular outlining, in as much of an A. B. C. detail as possible, how to exercise these rights or how to dispose of them, telling them by all means not to sacrifice them because they had money value.

We did a great deal of work in educating the stockholders to use and understand the rights.

We organized immediately a separate unit, we got 45,000 square feet of floor space, equipped it with all that is necessary

in an office, desks, chairs, typewriters, filing cabinets, stationery, adding machines, etc.

We answered some 25,000 letters of inquiry. We took in 283,000 separate subscriptions. We made innumerable transfers of warrants from one person to another. We received in cash during the few months $225,000,000—practically all of which we put into short term, high grade securities, so as to keep that liquid and always available, so that when associated companies needed the money it would be there.

To do this work it was necessary for us to interview something over 3,000 employees, or prospective employees, out of whom we selected about 1,000, and it was necessary to give those employees a very excellent training, so that they might do their work accurately.

911 Of course, in doing this work—it is all very definite and must be done accurately and precisely,—it is necessary not only to do the work, but to have verifications of the work going on at all times.

It is money that we are dealing with and negotiable paper of value that we are issuing, and we must, of course, not only do it as cheaply as possible, but we must also do it accurately.

As to the interest rates we were able to get on the short term investments I spoke of, they depend on the period when you have the money available. In 1930 we started getting fairly good interest rates for that paper—2¾ per cent, tax exempt—but as they matured, we got to the point where we were getting less than 1 per cent, while the funds were being carried.

It is very necessary in carrying large sums of money like that to keep it in the highest grade, ever maturing securities, so as to avoid losses if you have to have the money. We want the securities to mature so that they will be paid off at their face value and we know then what we are getting. Our
912 first consideration is safety, and with due regard to safety, we did get the best trades we were able to make. We had four issues of stock during this period and the winding up of a fifth stock issue which started in 1922 and came over, and the final payments of which were made in 1923.

Also during that period, we had an offer of $219,000,000 of convertible bonds of the company. The handling of the convertible bonds and the other stock issues involved the same routine that I have described in connection with the 1930 stock issue.

When the stock is sold and issued, the work of the company is by no means finished. There is then an annual service, in fact a day-to-day service, that is necessary in order to take care of the securities. For illustration—in the financing, we have developed a list of about 125,000 bondholders. Those bondholders can exchange coupon bonds for registered bonds, or they can have the coupon bonds registered as to principal,

or they can exchange bonds of one denomination for 913 bonds of another denomination, and the company is the

agency that carries on that work—the Treasurer's department carries on those exchanges.

We have also developed up to December 31, 1931, a list of 645,000 stockholders.

We had that many different stockholders on that date. We have considerably more now.

Those stockholders are continually changing their holdings in the stock and changing their addresses. During the nine-year period, as an illustration, we had 875,000 transfers of stock. In connection with those transfers, we canceled 2,100,000 stock certificates and we issued 1,800,000 new stock certificates.

The bondholders holding coupon bonds have interest coupons attached to their bonds and these coupons, as you know, are cut off at periods of six months and they collect their interest through surrendering these. The Treasury Department pays the coupons as they mature and are presented.

During the nine-year period we paid 7,325,000 coupons.

The stockholders are entitled, likewise, to dividends declared, and these have always been paid quarterly.

During that period they were paid quarterly. We
914 issued about 14,800,000 dividend checks which must be
delivered through the mails to the proper addresses and

when paid must be checked up, verified, and proper accounting records kept, and from the payments made we must make reports to the Federal Government of the information at the source as to income taxes and also to some of the State Governments that require the same kind of service.

During that period, in handling the work in the Treasury Department we received and dispatched 3,000,000 letters. I think that gives you an indication of the amount of work that goes on day to day in the office.

The total amount expended by the Treasury Department for doing its work of all classes in the nine years was $13,034,000. It was as follows in the separate years:

1923	$ 954,861
1924	1,258,097
1925	944,914
1926	1,381,752
1927	1,103,130
1928	1,648,226
1929	1,591,063
1930	2,499,674
1931	1,652,282

The total cost of handling the new security issues was $3,154,000 for the nine-year period. For each of the years separately it was:

1923	$ 74,255
1924	389,093
1925	55,773
1926	444,595
1927	80,575
1928	588,071
1929	404,130
1930	979,305
1931	138,122

The total cost of the financial service rendered to the General Departments, American Telephone and Telegraph Company, was $469,000. For each of the years separately it was:

1923	$ 26,130
1924	36,188
1925	42,253
1926	43,714
1927	54,884
1928	56,617
1929	61,452
1930	71,850
1931	76,325

Under the employees' stock plan the cost of handling our work was approximately $600,000. For each of the years separately it was:

1923	$ 24,526
1924	41,871
1925	11,136
1926	17,634
1927	51,986
1928	55,496
1929	36,384
1930	178,091
1931	183,614

The expense in my department during the period in question in connection with advice to the associated compa-
917 nies in regard to their treasury work, getting out bulletins for them and their guidance, etc., was $210,000. By years it was:

1923	$ 8,677
1924	10,445
1925	15,856
1926	18,219
1927	32,687
1928	25,373
1929	29,216
1930	34,410
1931	34,592

The cost of handling the custody of the company's funds and the advances thereof to the associated companies during the period was $721,000. By years it was:

1923	$ 40,158
1924	55,614
1925	64,934
1926	67,179
1927	84,343
1928	87,009
1929	94,437
1930	110,418
1931	117,296

918 With respect to the nature of the advisory work to associated companies,—the main problem which the licensee companies have in the Treasury Department is the drawing in of funds which are collected throughout the territory and deposited in banks, and getting them into headquarters cities so that they are ready for disbursement, and then the disbursing of the funds.

Our studies have been in connection with banking relations, in dealing with the balances justified in the various points, with the safety of the banks and with the methods of getting the money in.

They have also been in connection with the disbursing of the money and with the writing of payroll checks and the delivery of payroll checks.

They have been in connection with the requirements of the transfers of stock of those companies and the servicing of the bonds which are outstanding, the paying of the coupons, the accounting for the paid coupons, the cremation of those coupons and dealing with the trustees in connection with that cremation, and they have been with many other general and related problems that go on in the ordinary work in the Treasury Department.

919 The purpose of all of it is to work in the best and most economical way and to conserve the funds of the company, to get them ready for disbursement as quickly as possible, and to use as little money in carrying on the transactions of the company as is justified. That is accuracy and economy.

The amounts that I have stated total about 40 per cent of

the expenses of my department, which leaves 60 per cent, or about $7,880,000. That expense is very largely concerned in servicing of the outstanding securities of American Telephone and Telegraph Company, the transfer of the stock, handling the dividends, paying interest coupons. That is something that an ordinary corporation would have to do that has securities outstanding in bulk—in numerous hands. That is, the treasurer's office of any corporation with a large list of stockholders would have as part of its work the work that I have referred to here. That cost was $7,879,000 for the nine-year period.

920 The employees' stock plan was first established as of May 1, 1921. That is a plan offered to all the employees of the Bell System, whereby those of six months' services or more are entitled to subscribe to stock on the basis of pay.

There is also a provision in the plan which authorizes those who have secured shares under any of the plans of the American Telephone and Telegraph Company and hold those shares, to subscribe for additional shares and assign the dividends in payment for them. We handle the issue of the stock and all the subscriptions of the General Department employees.

921 The treasurers of the associated companies handle the subscriptions of the employees of the associated companies up to the point where the shares are fully paid for. We issue the stock and we also keep full records of the dividends, assignments and subscriptions. The treasurers of the associated companies do not keep those records. We keep them in the Treasury Department. The plan is that they may pay either $3.00 or $4.00 per share per month, or, if they pay weekly, they pay 75 cents or $1.00 per week for four weeks of each month, and they cannot pay for it as long as they are employees otherwise than in that way, so that at the present time it runs over a period of around from 36 to 40 months. During that period the employee has a right at any time to cancel his subscription and to receive back the amount of money that has been credited to his account through deductions of pay or through assignment of dividends, plus interest

on that money. Recently the stock has fallen below the
922 subscription price and there have been a large number of cancellations.

When the plan was first adopted, the employee was required to pay par or $100 per share. It has been changed several times; first change was from $100 to $105; then to $110; then $115; then $118; then $121; then $125; then $130 and lastly $150.

Prior to 1921 there had been three employees' stock plans in effect. Also prior to that time the employees to whom stock was issued including employees of the subsidiary companies. That plan was carried out by delivery to employees of only such stock as has already been issued; that is, reacquired and placed in the hands of trustees. There was a change in the 1921 plan whereby the stock was issued to employees might be either issued from the treasurer or picked up in the market and transferred to the employee.

923 Prior to the adoption of the 1921 plan the law of New York State did not permit stock to be issued to the employees of subsidiary companies. There was a law shortly before 1921 which authorized stock to be issued to employees of the company but not to the employees of the subsidiary companies, and as soon as the law was changed permitting it, the terms of the law were embodied, or at least were taken advantage of by American Telephone and Telegraph Company in the adoption of the plan of May 1, 1921.

The objects of those several stock plans were to benefit the employee and hold him to the service of the company, to prevent turn-over, which is expensive—labor turn-over which is expensive to all companies. It was to give the employee an interest in the business and cause him to be more interested in his work and in the service of the company. The plans, without question, had that effect. Very generally the employees of the Illinois Bell have subscribed for the stock of American Telephone and Telegraph Company under this plan.

924 Basing the values of the stock on the market price on the day that the employees were entitled to receive the

shares, the market value of the stock issued to employees of Illinois Bell has been in excess of five million dollars over the subscription price. That is if they had turned around and sold the stock on the day on which they were entitled to receive it they would have made a profit of more than $5,000,000 over and above their salaries.

I am familiar with the general nature of the work that goes on in the offices of the treasurers of the associated companies. That work differs from the work done in the office of the treasurer of an ordinary commercial or utilities company in three main particulars—first, when the treasurer of an associated company needs money, as they often do, because all of the companies have been growing during this nine-year
925 period, they have arranged with the American Telephone and Telegraph Company for advances to be made to them; and those advances have been made to them when they were desired, and consequently they have not been required to carry these amounts on hand, idle. They have been able to get them just at the moment that they have asked for them.

Second, through the fact that they have gotten them from one source, their securities have been issued to one holder, the American Telephone and Telegraph Company, and they generally have only one stockholder. Some of them have a few more, but the bulk of the stock of those associated companies that is outstanding is in the hands of American Telephone and Telegraph Company, so that with one stockholder they are not required, they do not have to have elaborate stock books to make transfers, to pay dividend checks to a large number of people, and consequently they save the expenses that would otherwise be incurred to do those operations.

The third difference is the fact that because the treasurer's office of American Telephone and Telegraph Company maintains a staff for research and methods, they are not put to the expense of doing so themselves. When they want
926 studies made, when they want special information, they write to us or they talk with us about it and they get the services from the treasurer's office.

Many of the expenses incurred in our office are for particular services directly assignable to the associated companies and during the nine-year period amounted to $1,720,000.

By years they are:

1923	$ 85,863
1924	123,205
1925	116,199
1926	127,103
1927	194,147
1928	193,483
1929	191,899
1930	337,044
1931	351,456

The remaining services are very largely for the benefit of the associated companies to the extent of 90 per cent to 94 per cent. The larger part of the services that are not directly assigned as just stated are for the services rendered in getting money and in paying out money in handling the temporary investments and keeping them invested in high class securities and in servicing the securities of American Telephone and Telegraph Company now outstanding, the registration of dividends, etc. The 6 per cent in the part of our services that I have eliminated, as not of direct benefit to the associated companies although they do benefit to some extent.

The amount of money that has been raised by American Telephone and Telegraph Company and invested in Western Electric, in Bell Telephone Securities Company, in Bell Laboratories and in the 195 Broadway Corporation, is about 6 per cent of the assets of American Telephone and Telegraph Company. That is where I get my 6 per cent.

The assets of the associated companies represent more than 90 per cent of the total assets of American Telephone and Telegraph Company, and I have figured that the expenses of my department follow those assets.

The 195 Broadway Corporation is the holder of title and the operating unit for handling the Headquarters Building of American Telephone and Telegraph Company.

So that to the extent that the occupants are rendering service to the associated companies, the expense of my department in connection with that company should fairly be said to apply to the associated companies, to the extent that it is only a matter of financing that is involved because any services performed for the 195 Broadway Corporation are charged to that corporation and the accounts of the 195 Broadway Corporation are entirely separate from the accounts of American Telephone and Telegraph Company. The expenses of my office consist in getting the money for them that is all that remains in my expenses.

The Bell Telephone Securities Company has received advances from American Telephone and Telegraph Company in order to carry on its work. American Telephone and Telegraph Company owns the entire amount of the capital stock of Bell Telephone Securities Company outstanding, amounting to $1,000,000. They hold advances at the present time of about $6,500,000.

During the period that we have been discussing, the amount of money advanced to Bell Telephone Securities Company is $4,000,000 more than it was at the beginning of the period. Getting the money and handling it in connection with those advances constitute practically all we have done for that company. We have attempted to eliminate in the figures I gave you the expenses of the Bell Telephone Securities Company. They are taken out of the expenses directly apportionable. There is some little expense included in the totals in the nature of rent,—otherwise the expenses are all taken out. The Bell Telephone Securities Company undertakes to inform the public of the securities of the Bell System. It issues yearly a pamphlet in which a description is given of every Bell Telephone security issued and outstanding. It tells the story of the Bell Telephone System, of the soundness of its securities, and that has a very wide distribution. It is sent to bankers, brokers and to individuals who are interested in it.

The Bell Telephone Securities Company also issues and distributes widely a pamphlet known as "Some Financial

Facts," which tells the story of the Bell System for about fifty years.

The Bell Telephone Securities Company undertakes to distribute the stock of American Telephone and Telegraph Company as broadly and as widely as possible, and it performs for investors the service of buying American Telephone and Telegraph Company stock for them and allowing them to
931 pay for it either in one payment or in installments over a period of months.

It is all for the benefit of American Telephone and Telegraph Company and the Bell System, generally.

The Bell Securities Company does not deal in securities of any other company or companies except the Bell System. The services that we performed for the Western Electric are mainly in the fact that we have advanced to Western Electric or have bought stock of that company and through those operations have furnished that company with about $157,000,000, —during the nine-year period $89,000,000. The cost of the financing of Western Electric mentioned is in what we term the "Residue of Expenses" and the $7,880,000 of extra expense incurred over the nine-year period has not been charged as expenses directly allocated to the license contract.
932 The Associated Companies get the benefit of some of that indirectly.

The fact that we allow the employees of Western Electric to participate in the stock plan is of substantial value indirectly to the Associated Companies in that it cuts down the costs of manufacture by Western Electric in behalf of the Associated Companies, or cuts down the cost of goods which it manufactures for the Associated Companies.

The financing that we do for Western Electric furnishes the money on the cheapest basis that the Western Electric could get it. American Telephone and Telegraph Company does not buy, sell or deal in securities in the accepted sense. It makes advances to the Associated Companies and takes their securities. It does not sell them. If does not deal in securities of any companies. It is not a dealer in securities.

It does not make purchases of any securities except the
933 securities of the Associated Companies and its own sub-
sidiaries. In one case I recall it bought some stock of the Radio Corporation of America but the amount that it held during this period was less than $160,000 and that was only part of the period when it had that. Its surplus funds that it is not needing at the moment for advances to its subsidiary companies, it invests usually in Government certificates, bills, short term securities and in time notes of very high grade issued by cities and states.

Re-direct Examination by Mr. Goldstein.

The licensees get the benefit of the financing by American Telephone and Telegraph Company of Western Electric because Western Electric gets cheap money and there is also a more satisfactory personnel of Western Electric.

934 American Telephone and Telegraph Company finances the cash requirements of the licensees which requirements are mainly for construction purposes for improvements of their plant account. I don't know what percentage of the purchases by licensees from Western Electric go into plant account. I don't know how much the Western Electric receives in cash from the licensees each year for purchases made. I know how much the licensees require from American Telephone and Telegraph Company but not the amount that they pay to Western Electric.

I should say that the Western Electric would be satis-
935 fied by this plan that the licensees' credit is good and enables them to do business without considering the question of cost of credits, knowing that the licensees will have all the cash available for all requirements, and that the money will be forthcoming. I don't know what the cost of credit is ordinarily to a manufacturer.

$157,000,000 represents the total investment of American Telephone and Telegraph Company in Western Electric to December 31, 1931.

That includes temporary advances and money of all kinds.

It is the total amount as of December 31, 1931. The American Telephone and Telegraph Company had advanced to the licensees $1,438,000,000. When I say advanced that amount of money, I mean that the general process is to advance them the money, loan them the money when they require it, ask for it, or arrange for it. If in a particular year the licensee did not have any borrowings and did not owe the American Telephone and Telegraph Company any money, I would include that in the departmental expense also. So that $1,438,000,000 is really the amount of money which the American Telephone and Telegraph Company used to purchase stock as a stockholder of the licensees and to advance money in the form of credit obligations, if in the original case they issued stock. It is in effect true that where the licensees owed the American Telephone and Telegraph Company money when the stock issue was authorized, that the American Company would accept the stock and pay for the stock by cancelling the note. All of the service of the American Telephone and Telegraph Company is to raise this $1,400,000,000 for the licensee. The expense of the department incurred in raising that money I gave as $3,154,000. It cost the American Company that $3,000,000 to raise $1,820,000,000 used to purchase stock, and also to lend money to the subsidiary companies. The purpose of the Bell Telephone Securities Company is the acquainting of investors with the facts regarding the outstanding issues of the subsidiary companies and of the American Telephone and Telegraph Company. Outside of the one issue of bonds in 1923 of $50,000,000, the Illinois Bell Company has made several issues of stock and that stock was subscribed for to the extent of 99 per cent, or whatever the percentage is by the American Telephone and Telegraph Company. So that other than the minority interest in stock there were no other public issues made from 1923-1931 other than the $50,000,000 bond issue which was sold to J. P. Morgan & Company. The direct acquainting of the issues of the Bell System, so far as the Illinois Bell issues are concerned, would be to acquaint the investors with the merits of that bond issue. The Illinois Bell sold that bond issue to J. P. Morgan & Company. I

don't recall the discount paid, but there was some discount. I should say the American Telephone and Telegraph Company holds approximately 90 to 92 per cent of the stock of all of the licensee companies in the Bell System. So that the Bell Telephone Securities Company acquainting investors with the merits of the Bell System Licensees, refers to the 8 per cent of the stock outstanding and all of the bonds, which bonds amount to about $500,000,000.

They were in each case sold to bankers, American Telephone and Telegraph Company not buying them. I know there was a difference between the price at which the syndicate bought them and the price at which they offered them to the public.

940 During the period American Telephone and Telegraph Company sold to the bankers three debenture issues at less than par, and during the same period American Telephone and Telegraph Company sold to the public not through bankers but through its stockholders, an issue of bonds of $215,000,000 in 1929 and issues of stock of $800,000,000 or $900,000,000, which bonds and stocks were sold to stockholders
941 at par. Some parts of the unsubscribed portions of bonds and stock were sold to the public. None was sold below par.

In 1921 the Bell Securities Company was organized, its purpose being at that time merely to disseminate information to the existing investors of the Bell System. In 1923 the Bell Securities undertook to interest investors in the stock of American Telephone and Telegraph Company through the employees of the Bell System largely. The Bell Telephone Securities Company is a skeleton organization which directs the work of the employees of the licensee companies and the work of disseminating information to investors, and has done so for several years.

That work began the middle part of the nine-year pe-
942 riod. Beginning with 1923 the number of stockholders in American Telephone and Telegraph Company started to grow and it has been growing right along. In 1921 the number of stockholders was about 160,000; at the end of 1931,

645,000. I consider it of benefit to the Bell System to have widespread ownership of American Telephone and Telegraph Company stock and it was of benefit to American Telephone and Telegraph Company because of the ability to secure the funds needed to carry on its work and furnish money to the Associated Companies of American Telephone and Telegraph Company. The American Telephone and Telegraph Company could have secured funds by selling the stock to bankers. Between 1921 and 1930 we have never offered stock to bankers, except as stockholders.

944 The purpose of having a widespread ownership was to get money. The employees of the Bell System in connection with sales of stock assisted those who asked for assistance at the business offices of the Associated Companies. Some employees did undertake to reach the investor before the investor came to the office and asked for the assistance, which work was done at the direction of the president of the subsidiary company.

945 At the suggestion of one of the presidents of one of the subsidiary companies, we made a study to see what could be done to avoid losses to the stockholders, who are all patrons of the company locally, the president making the statement that it would be of distinct public advantage, an advantage of public relations if the ignorant stockholder were protected in his rights, and we developed the plan whereby, during each stock issue we would secure the names of the stockholders who at the last offer had failed to take advantage, and the presidents of the associated companies were told that those cards were available for them if they cared to use the information, and then they asked for the information and all of them had it given to them and they, on their own initiative, turned those cards over to their people to ferret out those stockholders to see that they lost nothing.

Mr. McCulloch of the New York Telephone Company suggested it. He would be interested in the sale of the stock of American Telephone and Telegraph Company because it would give him an excellent opportunity of making an excellent friend in his own territory. He would not be interested

in anything outside of the Bell System. He is interested
946 in the general well-being of the Bell System and in seeing that funds are raised to take care of his company's requirements, the sale of stock of American Telephone and Telegraph Company being the main source. The issue of stock of his company to American Telephone and Telegraph Company as a stockholder is the medium by which funds are raised for the New York Company. He is interested in the American Telephone and Telegraph Company buying stock of the local company as a medium of getting his funds. He is also interested in seeing that American Telephone and Telegraph Company has enough money to buy the stock of the local company. As to whether he would be interested in seeing that the minority stockholders of Illinois Bell also have money to buy the stock of the Illinois Bell, I don't think that would reach him. If he had them in this locality, I think he would serve them. If he had the stockholders of the Illinois Bell here and they went to him for help, he would give it to them.

948 The licensee company is interested in raising money; so, if it issues stock to raise money, then it is interested in selling the stock. The Illinois Bell 1923-30 was interested in selling its stock. The purchasers of the stock would be the stockholders of the Illinois Bell. The Illinois Bell is therefore interested in seeing that the stockholders purchase that stock. I assume that the Illinois Bell is then interested in seeing that the largest purchaser of that stock, American Telephone and Telegraph Company, has the money called for to buy the stock. There are minority stockholders of the Illinois Bell, but American Telephone and Telegraph Company owns 99 per cent plus of the stock.

I cannot say whether the Illinois Bell concerns itself at all with the ability of the minority stockholder to purchase any portion of its stock. I don't know whether the ordinary
949 corporation takes any steps to help its stockholders to raise money to purchase its stock. American Telephone and Telegraph Company never took any steps to help people raise money to buy its stock. If the employees of the Bell System who purchased stock had sold the stock on the day of

purchase according to the market prices of that stock at that time, there would have been a profit to those employees of $5,000,000. The first subscription for employees was at par. After that it went up. The stockholders of American Telephone and Telegraph Company that subscribed to issues from 1923 paid par for the stock. I have never determined what the market price of the stock was on the date when they purchased that stock at par, and I never determined how much profit they would have made if they had sold their stock on the day that they purchased it at par. If the licensees wanted to give stock for the advances, we took it. If they wanted to give notes, we took those. I am sure that the Illinois Bell got such consents as were necessary of the Illinois Commerce Commission in connection with each stock issue 1923-1930.

As to who determined whether a licensee company was to give note or stock for the moneys which American Telephone and Telegraph Company turned over to it, I should say it would be a negotiation with the American Company as to which they would take. The negotiations would not be carried on with me.

As to the amount of money required by the licensee companies, we know at the time the provisional estimates are completed as to the approximate amount that would be
952 required. We get that information from the associated companies. We get it in the form of a statement from the comptroller of the American Company. He must get it from the reports that are sent by the associated companies, —provisional estimates. The comptroller tabulates the approximate amount of money that will be required by each of the associated companies for that year. That tabulation is received by me some time after the first of the year. The comptroller advises me whether for the money advanced I am to take stock, a note or an open account. The authorization for each advance or each payment to a licensee comes
953 from the comptroller, and at that time I am advised whether to take a note or to take stock. I do not get a

notification in advance of the actual transaction of the probable amount of stock of open accounts or notes which will come from the financing for the succeeding calendar year. The comptroller gives me an estimate of the amount of money I need to have on hand in order to fill all requirements.

I used the same amount of money to pay the associated companies $50,000 or $500,000, whether they give us a note for it or whether they give us stock.

The three stock issues and the one bond issue I testified about were 99 per cent subscribed. I think in the last one there is less than one-third of 1 per cent unsubscribed.

An ordinary corporation of large size would incur expense of the character of the $7,000,000 expense I testified about. I think that if an ordinary corporation wanted to get the amounts of money that the American Telephone and Telegraph Company has gotten, it would have to sell its securi-
955 ties in the same manner the American Telephone and Telegraph Company did. I do not know of any large corporation that sells its securities through bankers. Many corporations sell their bonds to bankers. I think that the usual method followed by corporations in disposing of bonds is to sell them to bankers. I would assume the same con-
956 dition existed with the other corporation,—ordinary corporation,—as existed in the case of American Telephone and Telegraph Company. By that I mean I assume they sell their bonds through bankers and sell their stocks to the public.

The bond issue of 1929 of American Telephone and Telegraph Company was a convertible bond issue but it was sold to stockholders. Not all temporary funds are invested in Government securities. Some are invested in notes issued in anticipation of taxes by municipalities. We did not buy any railroad or utility bonds.

The Bell Securities Company performed a service to the Bell System in widely distributing the stock of American Telephone and Telegraph Company. Wide distribution of stock furnishes a source of money supply,—people that know the security and are willing to put more money into the security.

Diversity of ownership is preferable to a concentrated ownership by a few people because no few people could possibly own a company of this size. We also think it of benefit to have American Telephone and Telegraph Company stock owned in the locality in which the service is rendered to foster public opinion.

I have not seen the contract between the American Telephone and Telegraph Company and the Licensee companies in connection with the stock sold to the employees of each of the companies, but it must provide that the services performed by the Licensee Companies in connection with the stock shall be without compensation from the American Telephone and Telegraph Company because the licensee company is the only person that can perform service in connection with the sale of American Telephone and Telegraph Company stock to licensee employees. The licensee company does not get paid from the American Telephone and Telegraph Company for this service but they get their expenses from the Bell Telephone Securities Company; that is, any extraordinary
959 expense that they are put to in handling, such as for postage, printing, etc.

I cannot definitely answer whether any portion of the time of an employee of a licensee company consumed in selling stock, is paid for by the Bell Securities Company.

960 We make up monthly and annual reports of the cash receipts and the cash disbursements. The same cash being counted several times during the year. The moneys I stated went to the licensee companies, went there and stayed there. I cannot say definitely whether that came alone from the sale of securities, because American Telephone and Telegraph Company during that period accumulated $293,000,000 in undivided profits. Both the money from the proceeds of the sale of securities, the proceeds of the securities and undivided profits were intermingled in the treasury, and we don't know which went where.

961 I considered 195 Broadway Corporation as a separate corporation, apart from the Bell System in the treatment I gave to the expenses. All expenses of that company are in

the expense accounts of that company and no part of those expenses have gone into the expenses of the treasury department. All money advanced to that company was considered when I made the elimination of 6 per cent of the residue of expenses; that is, I eliminated all advances to 195 Broadway.

965. The Bell Telephone Laboratories I also treated as outside the Bell System, just as I did the 195 Broadway, and in the 6 per cent elimination I eliminated that portion of the expense attributable to investments. I treated Bell Telephone Securities Company the same way.

Employees during the entire period cancelled subscriptions to stock and did so when the market price was above the subscription price. They received back the amount of the deductions or assignment of dividends, plus interest. That rate of interest has varied. They got back all their principal. We had cancellations of subscriptions when the market was up and also when the market was down.

Re-cross Examination by Mr. Blackman

965. The $7,000,000 expense which I spoke of was character of expense that any large company that had its stock well scattered would be bound to incur. That is, it would incur it not to the same extent but ratably in proportion to the amount of stock it had out.

Re-direct Examination by Mr. Goldstein

If American Telephone and Telegraph Company wants to raise additional funds, it is particularly interested in having its stock widely scattered. If it does not care to raise funds from its stockholders, it would not be concerned. The associated companies, if they expected to get money from the American Company, would be concerned. From the standpoint of public relations, the associated company is quite interested in having as many stockholders of American Telephone and Telegraph Company as possible located among its patrons. Probably if it could get all other things in equal benefit, it

would be more interested in having as many stockholders as possible in its own company. By "other thing" I mean
965 if it did not have the expense of handling its securities, if it did not have the expense of finding a market and did not have an expense of distribution and all the other expenses that go with it, and also if it did not have competition with all the other companies in getting money out of the market.

I don't think that the Illinois Bell would be better off in having widespread ownership of its stock if it turned out that the licensee companies paid for the expense of issuing the securities and paid for the things which I have said were the other things that a company would have to take into account in determining whether it would be better off to have a concentrated ownership or to have a widespread ownership of its own stock, because I think that one well nationally
966 known security as a source of money supply is much more certain. We can have conditions in different parts of the country that may affect local securities and that would affect the widespread securities only in those localities, and furthermore, it would be a difficult thing for that company to acquaint people with its own stock to the extent that they are acquainted throughout the whole nation with American Telephone and Telegraph Company stock, and in many localities the local companies would not find enough people with enough wealth to float its own securities in its own locality.

I think it is to the advantage of each of the associated companies to have stock of American Telephone and Telegraph Company owned by the public instead of their own securities by the public and by their stockholders, than their own securities, or their own stock.

967 Some companies do think it would be of advantage to them to have some of their own stock owned in the localities and in that case they have issued preferred stock and they offer that to their security holders.

I think it is of advantage to each of the associated companies to have stock of American Telephone and Telegraph Company outstanding as the stock of the nation wide tele-

phone business than to have the individual stock of any company or every company outstanding throughout the nation, or even throughout its own locality, because American Telephone and Telegraph Company stock is a nationally known stock and people move from one section to another of the country and they all know about it; it is written up in the 968 newspapers and in the periodicals; it is bought by their own employes, it is bought by other telephone company employes and those employes are interchangeable and they shift from company to company and they know the stock of the parent company. I think there is little distinction made by the public as to whether it is the stock of the individual company or the American Company that they own. They know that it is Bell Telephone stock and I think the ownership of the nation-wide stock is a safer and saner stock to give to the public than the stock of a local company. For all reasons, as I see it, it seems to me better that the stock that they own or the stock that is owned by the public and by the employes, is the same stock and a nation-wide stock.

I consider that part of the service of American Telephone and Telegraph Company to each of the licensee companies is the financing of their needs in the manner in which it has in fact been done during the last nine years. American Telephone and Telegraph Company stock is considered for the reasons stated a high-grade stock. All Bell System securities are considered high-grade issues. I mean rated high by the agencies that rate them—Moody's, Standard Statistics. They are high-grade securities and the institutions that do rate them, rate them highly, such as Moody's and Standard Statistics, but their rating has no effect on what I consider them to be, but they are rated as high-grade securities.

CHARLES A. HEISS:

Direct Examination Continued by Mr. Blackman.

2601 The source of the figures shown in column 1 of this sheet (Plaintiff's Exhibit A-154 for identification) is the books of the Company. The figures in column 2 were taken from page 914 of the deposition of the Treasurer, Mr. H. Blair-Smith. The figures in column 3 are a computation made by me, but the computation is based on a percentage given by Mr. Blair-Smith in his deposition. That is, the 6 per cent that I use in column 3 is the figure which Mr. Blair-Smith said should be allocated outside of the license contract work in his department. Column 4 is merely the remainder that I get by deducting column 3 from column 2. Column 5 is an allocation to the Long Lines, and this allocation was made by me. The left hand section of column 5 shows the

2602 percentages used, and those percentages are a composite ratio of plant, employees, expenses and total telephone revenues of the Long Lines in relation to the associate companies, including the Bell of Canada and the Long Lines. This is the same ratio that I have used on some of the preceding sheets. It was taken from Exhibit A-100, composited, I believe, in A-103. In my opinion, that is the proper ratio to use to make an allocation of that part of the work that I am dealing with through the Long Lines, because the work of the Treasurer's Department affects all parts of the business, and every phase of the business, and I consider that a proper ratio, I consider the ratio used a proper one. Column 6 is merely the remainder that I get after I deduct the Long Lines portion from the total portion shown in 4. Next I allocate to the Chicago area, in column 7, and I use the same type of composite ratio, but include in the composite the factor of stations. Throughout all of these years, the

2603 ratio as shown in 7 for the allocation to the Chicago area is the same as the ratio shown in 5, modified only by the use of stations, in order to make the ratio as comprehensive as possible. In my opinion, the figures shown in the

last column to the right on this sheet are a minimum allocation to the Chicago area of the Illinois Bell Telephone Company of its fair share of the expenses shown and dealt with on that sheet for each of the years in question.

"Mr. Blackman: I offer the sheet (Plaintiff's Exhibit A-154 for identification) in evidence.

"Mr. Haight: The same reservation."

These sheets, Plaintiff's Exhibit A-155 for identification, were prepared at my direction and under my supervision. They purport to show an allocation to the Chicago area of the
2604 fair proportion of the expenses of the Comptroller's Department incurred in rendering license contract services during the years 1923 to 1931, inclusive. I am dealing now with my own department.

I will take these figures up a little in detail, and discuss them very briefly. Beginning with the Bell System methods, which is the first line for expense: the division of Bell System methods is 66 employees, and its work is almost entirely concerned with the preparation of efficiency accounting methods and practices in respect of plant, revenues and disbursements. We have, for example, the job of putting out in the Bell System, eighteen million telephone bills a month. Now, to do that job efficiently, promptly and economically, it takes a very high type of method, and a continuous survey of methods, to keep the costs down to the very minimum. Now, that is just a little illustration of one type of method work that is done by this section.

Other types relate to plant and disbursement accounting,
2605 motor vehicle accounting, estimates, standard methods of preparing estimates, approval, and so on.

Another section deals with the preparation of the Federal Income Tax return annually. We may say, briefly, that the work of this department is practically confined to devising efficient and cheap methods for the associate companies and the Long Lines to use in connection with their accounting.

There is very little work done by this department that is of benefit to the Western Electric Company, or the Electrical Research Products Company, and to the companies not included among the associate companies and the Long Lines.

We do not devise methods for those companies to follow in their accounting, except indirectly. They may get slight benefit from such plans as the employees' stock plan, or some method that we devise for the associate companies may be of slight benefit to them, but no methods are prepared for those companies. These are essentially telephone methods, to fit the needs of telephone companies.

2606 The chief traveling auditor makes an audit of each associate company and the Long Lines. He does not audit the Western Electric, nor the Electrical Research Products.

He makes an audit, in conjunction with the Western Electric, of the Bell Laboratories, but that audit is indirectly of benefit to the associate companies. But the Bell Laboratories is the only audit which he makes that is not a direct audit of the associate companies and the Long Lines, except that he makes an audit of the Bell Securities Company, too, and of the 195 Broadway Corporation, but that corporation, again, is a service organization, useful in rendering service to the associate companies and the Long Lines.

The 195 Broadway Company is a company which owns the building occupied by these departments which are serv-

2607 ing the associate companies and the Long Lines.

Next, general books and records is the division of my department which contains the books and accounts of the American Company, and also has to do with advancing funds to the associate companies and the Long Lines. It keeps the records of employees' stock plan transactions of the American Company, certain summary records for the System, and, in addition to that, prepares such reports as we must file with public authorities. I think that covers, in general, the work of that section.

A considerable part of that work is of direct benefit to the associate companies. For instance, the relations with the companies in the advancement of funds to them from time to time is one direct relationship; the matters relating to the employees' stock plan is another. Then, as regards the keeping of the books, this department keeps the books and the records for the several departments, and for the Company as a

whole, and in that respect it goes back indirectly as a benefit to the associate companies and the Long Lines.

2608 Considering the Chief Statistician, any large business that encounters the volume of business activity encountered in the telephone business must have a very well developed organization for analyzing the business, and for pointing out, bringing out of the various volumes of business and activities that take place, the essential facts for the executives and the officers, for administrative purposes.

Now, it is the function of our Chief Statistician in New York to develop the methods for use by the statisticians of the associate companies in analyzing the various phases of the business, what is happening in plant, what is happening in respect of revenue, what is happening in respect of expenses, in the growth of stations, and growth of business, and business conditions.

The Chief Statistician's organization in New York has as one of its large functions the development of methods of making analyses of that character. Then, the Chief Statistician's organization does, and has done in the past ten years, a large amount of work in the development of principles for applying mortality data to the depreciation problem, and in the development of proper depreciation rates. We de-

2609 velop the basic factors underlying our pension accruals, not only for our Company in New York, but the basic factors underlying the pension accruals of all of the associate companies and the Long Lines. This department also studies the question of fire insurance: is it cheaper to take out premium insurance, or can we self-insure our properties, and what are the best types of policies, what are the best methods, the most economical methods of providing protection for our properties throughout the System? This work is done for all of the associate companies and the Long Lines.

Now, none of this work is done for the benefit of the Western Electric Company, nor the Electrical Research Products Corporation, nor the Bell Laboratories.

The next division is the Chief Accountant's. The Chief Accountant has charge of all accounting matters taken up with

the Interstate Commerce Commission. For instance, our companies are required to follow a uniform system of accounts. In a business as large as ours, there are hundreds of problems of classification and accounting that arise each year.

2610 Now, these problems are referred to New York by the associate companies.

Many of these problems we can answer because of past rulings which we have obtained from the Interstate Commerce Commission, but on the other hand, there are numbers of them that we must take up with the Commission in order to provide the proper accounting for our various activities, and the Chief Accountant's work is to discuss these problems with the Commission, to obtain through one central source rulings for the companies, to take care of any matters involving changes in the system of accounts, changes in the annual report to the Commission, and so on.

The next division is Bell System Reports. Bell System Reports is a small division which combines for our executives the reports of the various associate companies of the System into a combined Bell System report. Those reports are furnished to our executives to give them a better understanding of the business, in order that they may, in turn, better serve the associate companies and the Long Lines; also to have a picture of the over-all volume and trend of the entire Bell System business.

2611 My next is an undistributed item. The undistributed item is merely expense incurred in connection with rents and house service, and so on. That is expense that should be prorated over the six sections preceding, and also part of it should be prorated to my own section, administration. My own section consists of myself, two stenographers, and one office boy. The word "administration" sufficiently describes just what I do. I supervise all of the activities.

In column 3 I develop a percentage, 5 per cent. The 5 per cent is an estimate. I discussed very carefully and at length with my division heads, what work they could possibly do which was of benefit to others—which was in connection with work other than that which benefited the associate companies

and the Long Lines, and, as I have already said, the only
2612 work that is done there is possibly an audit of the Bell
Laboratories, of which 95 per cent, at least, is of benefit
to the associate companies.

Then, the work we do in connection with the development of thrift plans, to the extent that the Electrical Research Products Company, or the non-Bell portion of the Western Electric, or the Bell Laboratories, benefits from those thrift plans. A little of the benefit of my work percolates out to those companies, and possibly an adjustment of my expenses should be made for that reason.

Now, we make up the consolidated income tax return, we get the data all prepared by the different companies, and so far as our work in New York is concerned, it is pretty largely a folding together of the companies. Now, we fold into that income tax return the data for the Electrical Research Products Corporation and the Western Electric Company and the subsidiaries of the Research Products Corporation, so that after I analyzed carefully my expenses from every angle, I came to the conclusion that over the period not more than about 2 per cent of the expenses of my department could, under any way of looking at this situation, be considered as incurred in connection with work which benefited
others than the associate companies and the Long Lines.
2613 Now, in order that there might be no question, to take
care of contingencies I took .5 per cent, and excluded
5 per cent.

Column 4 is merely the remainder after I have deducted column 3 from column 2. I develop another per cent in column 5. That is the same composite per cent about which I have testified, and is the percentage which I used in making the allocation to the Long Lines of its fair proportion of this expense. The work of my department is of a broad, general nature, and the accounting touches every phase of the business, and I have used a ratio which took that fact into consideration. The Long Lines Department has a large accounting organization of its own.

In column 7, I develop another per cent. That is the same per cent which I developed in the sheets that I have

2614 testified about previously, except that it includes stations, as testified to in the other instances, in instances in which it was used to make an allocation to the Chicago area. I have proceeded in each of the years in question in the same manner.

In my opinion, the amounts shown in the last column to the right of these three sheets which have been marked A-155 for identification, show a minimum amount that should be allocated to the Chicago area of the Illinois Bell Telephone Company as its fair share of the expenses dealt with on the sheets.

"Mr. Blackman: I offer the sheets (Plaintiff's Exhibit A-150 for identification) in evidence.

"Mr. Haight: The same reservation, if we may have it."

2615 This paper, Plaintiff's Exhibit A-156 for identification, was prepared at my direction and under my supervision. It purports to show an allocation to the Chicago area of the fair proportion of the expenses incurred by the Secretary's department in rendering license contract services for the years 1923 to 1931, inclusive. The figures in column 1 are taken from the books, directly and without change. In column 2 the figures are also taken from the books directly and without change. They represent the total expenses of the Secretary's department.

The figures in column 3 are estimates made by me, in co-operation with the Secretary, considering the general character of his work, the amount of work that he might
2616 possibly do that was of benefit to other than the Long Lines and the associate companies. Taking all those factors into consideration, and taking also into consideration that the Secretary holds a general administrative position, we considered that an exclusion of 5 per cent was a fair and proper exclusion to make from his total expenses.

My knowledge of the work of the Secretary's department comes from the fact that I have almost daily contact with the Secretary. In the discussion of matters of joint interest to his department and mine, I receive from him, monthly, his approved bills, classified in the manner in which I have asked him to classify them. I summarize them and prepare for him

a monthly administrative report, and, in that way, obtain from him a rather intimate knowledge of the work which he does.

This 5 per cent that I have taken off here in column 3 represents such possible work as he might do which was of benefit to Electrical Research Products Corporation, or which was of benefit to the Western Electric; but keeping in mind
that the larger part of the work done which is of benefit
2617 to the Western Electric is, in turn, of benefit to the asso-
ciate companies. This last factor that I have mentioned is what we might call the non-Bell business of the Western Electric, which is about 4 or 5 per cent. Dr. Jewett testified it was about 4 or 5 per cent. Then there might be some strictly corporate matters of the American Company that the Secretary might consider; and taking all of these items into consideration, we considered that 5 per cent was a fair and proper exclusion. There is one other factor there. The Secretary acts as Secretary for the Bell Securities Company, and, in that respect, a very small part of his time, probably a half a day a month, has been included in this estimate.

In column 4, I make the deduction for the amount developed in column 3 and the amount shown in that column is the remainder after that deduction is made. The amount in column 4 for any year is divided into two parts. The (A) portion is the amount which the Secretary has specifically
indicated as allocable directly to the Long Lines and the
2618 associate companies. For example, of the amount of
$4,372 in the year 1923, I was told that $1,093 should be allocated to the Long Lines. That represents his time in connection with keeping the minutes of the Long Lines board and such other direct services as he renders in connection with the keeping of the minutes of our state companies, which is a minor task, since they have very infrequent meetings. The Secretary renders services direct to the associate companies.

One character of that work is that he prepares and furnishes a list of the officers and administrative personnel of each company, and combines it with that of other companies, and distributes such a lisf to all of the companies for their

information. That is one type. The other type of service which he renders directly for the associate companies is that in case they have a problem requiring the formulation of an executive resolution, or a vote, our Secretary, having had many years of experience in that work, is very familiar with it and is frequently called upon by the secretaries of the 2619 local companies for advice as to procedure and methods of setting up votes for the consideration of the Board of Directors. But the greater part of this expense that I deal with here has only an indirect benefit to the associate companies. It deals largely with the work of the American Company, which in turn is largely incurred for the benefit of the associate companies and the Long Lines.

"Judge Wilkerson: The amount involved here is not very large.

"Mr. Blackman: It is very small.

"Judge Wilkerson: Is there anything in the license contract which entitles an associate company to require an officer of the American Telephone and Telegraph Company to do anything?

"Mr. Blackman: I think so.

"Judge Wilkerson: Or are the services rendered under some general clause of the contract?

"Mr. Blackman: Well, they are rendered under the general clauses of the contract.

"Judge Wilkerson: That is, there isn't anything specifically touching the officers of the parent telephone company?

2620 "Mr. Blackman: Nothing specifically.

"Judge Wilkerson: That gives to the associate company the right to require those officers to do anything for the associate companies?

"Mr. Blackman: I don't think there is anything specifically requiring the Secretary to do anything for the associate companies.

"Judge Wilkerson: This is offered under the general welfare clause?

"Mr. Blackman: Yes, sir, under the general welfare clause, and under the direction of the Supreme Court to show the fair

proportion of the expenses of the American Company that should be allocated to the Chicago area. Of course, we could not have the operation of this contract and the operation of these departments if we did not have a secretary's office.

"Judge Wilkerson: Yes, I understand."

I have developed some percentages for allocation on this sheet. Wherever percentages appear in the left hand column of section 3, the percentage is a composite ratio of plant, employees, expenses and total telephone revenues, and 2021 where percentages appear in column 7, they comprise the same composites, plus stations, and I used the composite ratio in making all the allocations, again because the Secretary's work is of a general overall character affecting all phases of the business.

In my opinion, the figures shown in the right hand column of this sheet show a minimum amount to allocate to the Chicago area of the Illinois Bell Telephone Company as its fair share of the expenses of the Secretary's Department of the American Telephone and Telegraph Company.

"Mr. Blackmar: I offer this sheet (Plaintiff's Exhibit A 156 for identification) in evidence.

"Judge Wilkerson: The same reservation?

"Mr. Haight: Yes."

This sheet, Plaintiff's Exhibit A 157 for identification, was prepared at my direction and under my supervision. This purports to show an allocation to the Chicago area of the fair proportion of the expenses of sundry items, including administration incurred in rendering license contract services 2622 during the years 1923 to 1931, inclusive. This sheet covers the administration section of the American Company, including various sundry expenses.

The figures in column 1 come from our books. The figures in column 2 are taken from our books also, directly and without change. The red figures are a credit made to the expenses for the years 1923, 1924 and 1925, in respect of restaurant activities. In those years the American Company conducted its own restaurant for employees, and these red figures represent the profits earned by that restaurant, and, inasmuch as

we had not charged up the restaurant with any rent specifically, we credited the profits back against expenses. The figures that I show in those years are the figures of expense for the Administration Department after the deduction of the restaurant profits.

I will state in a very general way, and briefly, what the character of the work consists of: under the head of 2623 administration, we have the expenses of the President's office, his secretary and staff, and in addition we show here the expenses of the office of Vice President Wilson, who reports to the President.

In later years, say, for example, in 1926, 1927, 1928 and 1929, Vice President Guernsey was also treated as a part of the Administration section, and his expenses are shown.

Now, in addition to the usual and ordinary expenses, such as salary, rent and house service, periodicals, books, and various items, there are included in these expenses such items as directors' fees, audits, expenses of an annual audit, the expenses of any contributions that might have been made in the interest of the business, and so on. That, generally, covers the character of these expenses.

I am familiar with the work of the Administrative department. I have fairly close contact with the President's office; there are many matters that my department has taken up with the President. In addition, I receive the approved expense vouchers, monthly, and prepare his administrative report, and in that way have a reasonable familiarity with all the general character of the work of the President's office.

2624 "Judge Wilkerson: Just why do you charge to the Illinois Bell a part of the salary of the President of the American Telephone and Telegraph Company?

"A. Because the American Telephone and Telegraph Company

"Judge Wilkerson: The American Telephone and Telegraph Company, as I understand the set up, owns a controlling interest in the stock of the Chicago Bell Telephone?

"The Witness: Yes, sir.

"Judge Wilkerson: And votes the stock?

"The Witness: Yes, sir."

"Judge Wilkerson: And the Bell Telephone has its own officers?

"The Witness: Yes, sir.

"Judge Wilkerson: Now, on the theory of this case we heard advanced here before, besides the services rendered under this contract, all the American Telephone and Telegraph had to do was to vote the stock of the Illinois Bell. Now, why should you charge a part of the salary of the President of the American Telephone and Telegraph Company to the Illinois Bell?

2625 "The Witness: Well, your Honor, let's look at the functions of the American Company. First we have the Long Lines Department. Now, the expenses of the Long Lines Department are entirely excluded from these figures. Now, what is left of the work of the American Company is very largely the work done in serving the associate companies under the license contract, and generally.

"Take, for instance, the work of Dr. Jewett, he has three or four hundred employes; the work of Mr. Gherardi's office, about five or six hundred employes.

"Judge Wilkerson: I understand that; but I wanted to know in particular in regard to the President.

"The Witness: All right. Now, the President supervises all of this work, and if the work of these various departments is chargeable against the associate companies, then the expense of the executive who has general supervision and directs generally all of those activities should be likewise apportioned.

"Judge Wilkerson: You have made this set-up on a
2626 theory which disregards, really, corporate form, and treats the business as—looks at it as an entire organization?

"The Witness: Substantially that. That is, that the expenses of the American Company are expenses in addition to those of the associate companies.

"Judge Wilkerson: That is, you have made this on the theory which the defense is contending in this case, namely, that the corporate form is to be eliminated, and that we are

to look at it as if it was one organization? Now, accepting that as the argument, you have made that on this theory; do I understand it?

"Mr. Blackman: I think that approaches it, sir. What we have done is this: we have tried to give what the Supreme Court said we should give, and that is the fair share of all our expenses connected with this license contract which we should allocate to the Chicago area.

"Judge Wilkerson: Now, on the other hand, as an offset, may there be charged against this anything that the Illinois Bell does for the American Telephone and Telegraph Company, on that theory?

"Mr. Blackman: Why, on that theory it might be an offset, perhaps, if the Illinois Bell does—

2627 "Judge Wilkerson: We will just forget for a minute that we have a series of corporations here, and look at this as one organization.

"If you allocate a portion of the expenditures of the American Telephone and Telegraph Company to the Illinois Bell, and it is really benefited by those—by this service—because, stripping this thing of its corporate form, and looking at it as one organization, this is really for the benefit of that department.

"Now, if the Illinois Bell, on the other hand, spends out its money for something which went to the supervision of that portion of the plant of the Illinois Bell which was used, for instance, in interstate commerce, that would be a legitimate set-off, on that theory?

"Mr. Blackman: No, sir, not these things. It might be a charge against the Long Lines. It would probably be allocated properly to the Long Lines, but not against this.

"Judge Wilkerson: Not against the license contract?

"Mr. Blackman: Oh, no, sir. Today our theory is
2628 this, sir: that is, we have figured this license contract as something against which we did not have to prorate our expenses. For years we went along charging fixed percentage rates for the license contract service, and we did not undertake to show whether we made a profit or a loss. Our

books do not allocate at all, and in a number of cases before the Supreme Court that practice was apparently upheld, on the showing that we were rendering a valuable service, and that the associate companies could not get that service for anything like the amount that we charged them; that they would have to pay a great deal more than that if they did it themselves.

"Now, in this case the Supreme Court has said that that was not enough, the showing that we rendered them a valuable service, and that it would cost them more to do it themselves than we charge them, but the Supreme Court wanted to know what it cost us to do the service.

"Judge Wilkerson: Just the cost to the American Telephone and Telegraph Company?

"Mr. Blackman: The cost to the American Telephone and Telegraph Company.

2629 "Judge Wilkerson: That is in the opinion.

"Mr. Blackman: Now, the opinion is not specific in what use is to be made of that cost. We assume that the Supreme Court wants to make sure that it is a fairly reasonable cost.

"Judge Wilkerson: If you show the cost is substantially what you charge for it, I should say that a conclusion might be drawn from that that a contract, which was not an arms-length contract, but a contract made between the company with another company—

"Mr. Blackman: The controlling company.

"Judge Wilkerson (continuing):—that owned a controlling interest, that it was not unreasonable. That the dominating company had not overreached the other, if you show it cost substantially what the contract covers.

"Mr. Blackman: That's it.

"Judge Wilkerson: All right.

"Mr. Blackman: And in that little chart that I put in evidence at the beginning of this branch of proof, that divides up the assets of the Bell System into little grooved squares.

You will see that there is practically nothing but the associate companies and the Long Lines.

2630 "Of course, there is the Western Electric, which we colored in light blue because while it was not an associate company, itself, its activities were directed 95 per cent, or thereabouts, to the service of the associate companies, and the proof that has been introduced tends to show that it sells its goods to them at a price that is not only reasonable, but lower than it would have the right to charge for an ordinary manufacturing profit.

"Now, Mr. Heiss has allocated these things on the basis, as I understand it, that the Administrative Department of the American Telephone and Telegraph Company administers all the other departments, which, of course, it does.

"Now, the energies of those other departments are directed, about 95 per cent, to the service of the associate companies under this license contract.

"Judge Wilkerson: Well, I think I understand the purpose of the testimony. I won't say what the effect of it is."

Referring to column 3, Exhibit A-157 for identification, I made certain deductions. My first step was to go through the expenses of the Administration Department, or the several departments included under the head of Administration, and eliminate certain special payments or items which I felt

2631 should be excluded. For instance, in the year 1923, I excluded two items totaling $93,000. In the year 1924, I excluded $18,000, and so on throughout the years.

In the year 1923, the year of the Japanese Earthquake, all of the companies, individuals in this Company, were asked to contribute to the relief fund for that catastrophe. The American Company, for itself and its associate companies, contributed $75,000. That amount is excluded. I have excluded the entire amount. Another item in that year was a payment of $18,000 made to a former President of one of our associate companies. I excluded that. It was a payment made to enable the Company to retire its President and put in his place a younger man, because at that time the conditions in that Company required a young and active man to administer

the work, it being just following the war, and the operating conditions required very careful attention. So, in order
2632 that the associate company might be relieved of that expense, the American Company assumed it. That item I have excluded. Those two items total $93,000. I have eliminated from each of the years any items of that kind. Take, for instance, the year 1930; I have eliminated $250,000, roughly.

Anything there was any question about, that was not an ordinary operating expense, I eliminated. In addition to these definite amounts, I eliminated 5 per cent of the remainder. In a discussion with the President, it was his judgment that we should eliminate for his department the average of the amounts eliminated for all of the other departments. Now, the average of the amounts eliminated for all of the other departments was about 3 per cent, so that there would be no question, to take care of any contingencies that I had overlooked.

2633 The percentages in column 5 and in column 7 are the same percentages I used in connection with other departments. The work of the Administration Section being, of course, general in character, and touching all phases of the business, I used a composite ratio which took into consideration all phases of the business.

In the allocation to the Chicago area, I included stations which I did not include in the allocation for the Long Lines, because the Long Lines had no stations.

In my opinion, the amounts shown in the columns at the extreme right of this sheet show a minimum amount to be allocated to the Chicago area of the Illinois Bell Telephone Company for its fair share of the expense of the Administration Department of the American Telephone and Telegraph Company.

"Mr. Blackman: I offer the sheet (Plaintiff's Exhibit A-157 for identification) in evidence."

This sheet, Plaintiff's Exhibit A-158 for identification,
2634 was prepared at my direction and under my supervision.

The sheet purports to show an allocation to the

Chicago area of a fair proportion of the expenses of the general service bureau.

The general service bureau is an organization which had, during the years 1923 to 1931, employees ranging from 113 to 203. Its function is to handle the service work of the Company, more or less common to all the departments of the Company, which work can be handled most advantageously by a central organization.

For instance, this bureau takes care of the purchasing and handling of supplies, distribution of supplies, or any mimeograph work, blueprint work, off-set process work, printing, and so on. In addition, it maintains a list of available material, supplies, clerks, stenographers, and office boys, as needed, it maintains a training school for office boys, and any work of a general character; it receives the mail, and distributes it to the different departments, and collects the outgoing
2635 mail and sees that it is cared for.

The figures in columns 1 and 2 were taken from the books of the Company, directly and without change. Column 3 is a computation made by me, and the 5 per cent used as the basis for the deduction is the same 5 per cent which I discussed in the case of the other departments here. It represents the composite of the eliminations made by the various departments to remove from their expenses costs incurred for work other than that which benefits the associate companies and the Long Lines. That is, because their work was less than 5 per cent, and this department was serving all of them, I have taken 5 per cent as a liberal allowance here for this department. The over-all percentages were about between 3 and 4, and so there would be no question, I took 5.

This department does no work except serving the
2636 other general departments. For instance, if the Operation and Engineering Department did this work itself, its expenses would be increased to that extent, and each department doing the work for itself would considerably increase the total cost of doing the general service work. It does not serve Long Lines. Its work is done directly for the departments furnishing license contract service. This organization

does not serve the Western Electric, except as it serves the Western Electric through the other departments of the American Company. It does nothing for E. R. P. I. If it does anything for the Long Lines Department, it bills that department for the cost of the work.

I have made an allocation to Long Lines of its share of this expense on the basis of the composite ratio of plant, employees, expenses and total telephone revenues. Again, the work of this department is of a general character, affecting all the departments of the Company, and the departments, in turn, deal with all phases of the business. That is,
2637 because the other departments, D. & R. and O. & E., are doing work for the Long Lines as well as the associate companies, I have taken a share of the expense of this department and allocated it to Long Lines on the basis of the percentage of the other departments. The percentages I use in column 5 are the same percentages we have dealt with in the other exhibits. And the same is true as regards column 7, allocations to the Chicago area.

In my opinion, the figures that appear in the last column to the right of this sheet are the minimum figures to allocate to the Chicago area of the Illinois Bell Company for its fair share of the expenses of the service bureau of the American Telephone and Telegraph Company.

"Mr. Blackman: I offer this sheet (Plaintiff's Exhibit A-158 for identification) in evidence.

"Mr. Haight: Same reservation as heretofore."

This sheet, Plaintiff's Exhibit A-159 for identification, was prepared at my direction and under my supervision. It
2638 purports to show an allocation to the Chicago area of the fair proportion of the expense of the Department of Operation-C, that is, Department of General Operation. No, let us change that a minute; the expense of the Department of Operation-C, commonly referred to as "Operation (General)", in rendering license contract services for the years 1923 to 1931, inclusive.

The figures in columns 1 and 2 were taken from the books of the Company, and in this instance they were given to me by

the head of the department. As a matter of fact, all of these figures were given to me by the head of that department, except the employee figures in the first column, which I took from the books.

Those allocations in columns 5 and 7 were also made by the department, and given to me. So that, really, I am not
2639 responsible for any of the figures on this sheet, except to make up and do the clerical work, or have the clerical work done, in preparing the sheet, and general discussion of the whole set up from time to time.

Mr. Blackman: "I have asked that this sheet be marked for identification and I won't offer it at this time, as I have up the matter with counsel for the defendants as to how we will deal with this."

TESTIMONY OF CHARLES P. COOPER.

May 18, 1932.

2640 Mr. Blackman: I just want to state to the Court that we have made a stipulation with regard to the testimony of Mr. Cooper, that he would testify if called, as follows—and I will just hand this statement to the stenographers—in support of that sheet which was put in at the last of yesterday's hearing.

Judge Wilkerson: Very well.

Mr. Blackman: Cooper is one of the Vice Presidents.

Judge Wilkerson: It may go into the record.

(Pursuant to said stipulation, the testimony of Charles P. Cooper is as follows:)

2641 "I reside in the City of New York and have my business office at 195 Broadway in that city. I am Vice President of the American Telephone and Telegraph Company and have held this position since August, 1926. Prior to holding this position I had the following training and experience:

"In 1907 I was graduated from Ohio State University and in 1908 entered the employ of the New York and New Jersey

Telephone Company as Plant Engineer at Newark, N. J. In 1912 I was appointed General Plant Engineer of the New York Telephone Company and in 1916 Division Plant Superintendent of that company. In 1918 I went to the Chesapeake and Potomac Telephone Company and was in charge at Washington, D. C., of all matters pertaining to plant. In 1919 I became General Superintendent of Plant of that company at Baltimore. In 1920 I was appointed General Superintendent of the Cleveland Telephone Company at Cleveland, Ohio, and later in that year General Manager. In 1921 I was appointed Vice President and General Manager of the Ohio Bell Telephone Company and in 1923, President of that company, which position I held until 1926 when I was appointed to my present position.

2642 "My duties as Vice President of the American Telephone and Telegraph Company consist of the following:

"Responsibility for the Department of Operation-C of which I am the head and general supervision of the Department of Finance, the Department of Accounts and of the General Service Bureau. The expenses of my office are confined to the salaries of myself, and of Assistant Vice President Bickelhaupt, together with the salaries and expenses of the employes of the Department of Operation-C together with the appropriate loadings for rent and other incidental expenses.

"No part of the expenses of the General Service Bureau, of the Department of Accounts in charge of the Comptroller, or of the Department of Finance in charge of the Treasurer, is included in the expenses of my office.

"Attached hereto marked Exhibit "A" and made a part hereof is the organization chart of the Department of Operation-C, dated February 1, 1931. This chart shows a total of 35 persons constituting the department. In the years prior to 1931 the numbers were fewer, except perhaps in 1929 and 1930. The expenses of said Department of Operation-C for the years 1923 to 1931, both inclusive, were as follows:

2643 1923, $241,740; 1924, $241,069; 1925, $243,589; 1926, $271,875; 1927, $265,671; 1928, $286,718; 1929, $317,727; 1930, $341,680; 1931, $327,647.

"These figures include the salaries of Mr. Bickelhaupt and myself.

"I have examined into these expenses and have determined what part thereof are in my opinion fairly allocable to the Chicago area of the Illinois Bell Telephone Company. Those amounts are as follows: 1923, $12,525; 1924, $11,952; 1925, $11,659; 1926, $13,059; 1927, $12,393; 1928, $13,640; 1929, $14,558; 1930, $14,441; 1931, $12,862.

"The following is a general description of the work under my supervision and of the manner in which I reached the allocation set forth in the table immediately above:

"The General Service Bureau, in charge of Assistant Vice President J. L. R. Van Meter, performs for the departments of the company those things more or less common to all departments which can more advantageously be handled by a central organization than by the several departments individually and independently, namely,

"1. The purchase and distribution of office supplies, 2644 stationery, furniture, printing and office appliances.

"2. The production or purchase of reproductions by the photostat, mimeograph, zincograph and kindred processes.

"3. General drafting work.

"4. The receipt and distribution of incoming and outgoing mail, express and freight matter.

"5. The employment, instructions and general supervision of all messenger forces.

"6. Finding suitable candidates for positions as clerks, stenographers and typists, and such other grades of employes as may be requested by department heads, and

"7. Miscellaneous general services.

"The books of the Accounting Department record the expenses of the General Service Bureau.

"The work of the Comptroller's office and that of the Treasurer's has been described.

"The Department of Operation-C performs the following classes of work:

"1. Advice and assistance to the associated companies

on matters of business and commercial policy, including revenue requirements, policies to be followed in regard to new business projects, new types of telephone service and 2645 wide usefulness of existing services.

"2. Advice in matters pertaining to negotiations of purchases and sales of operating properties.

"3. Supervision and recommendations with reference to contract relations with manufacturing companies including the Western Electric Company, also relations between the associated companies and the Long Lines Department, and broadly with matters that arise in connection with the general administration of the License Contract.

"4. Advice and assistance to the associated companies in connection with general agreements with railroads, electric light and power companies, oil and pipe line and telegraph companies, governmental departments, and similar general contracts and arrangements.

"5. Supervision of agreements and arrangements arising out of the ownership of patents by the American Telephone and Telegraph Company.

"6. Maintenance of official point of contact between Bell System and the Federal Radio Commission and co-ordination of Bell System relations with all government agencies as regards use of radio.

"Department of Operation-C is under the immediate 2646 direction of Assistant Vice President Mr. C. O. Bickelhaupt, who has reporting to him a secretary and five department heads in charge of different phases of the work. Considering these departmental heads in the order in which they appear on the chart:

"Assistant Vice President, Mr. E. V. Cox, has the following responsibilities:

"1. Supervision over the development and administration of the Standard Supply Contract which the Western Electric Company has made with the American Telephone and Telegraph Company, and the associated companies. All changes therein and interpretations thereof are subject to his review. He makes studies comparing the contract prices with the

prices obtainable from other suppliers and determines the amount of savings through the contract. When such information is required by the associated companies for public hearings he furnishes the facts.

"2. Matters affecting the License Agreement and extensions of the Agreement by sub-licenses.

"3. Obtaining and compiling information as to the territory and affiliations of non Bell Telephone Companies and reports thereon to the associated companies.

"Staff Engineer, Mr. Elam Miller, has the following
2647 responsibilities:

"1. Contracts and licenses for manufacture, sale and use under patents owned or controlled by the American Telephone and Telegraph Company.

"2. Consultation with and advice to associated companies on request for wire facilities for various special purposes other than telephone.

"3. Consideration of new services which might be rendered by the Bell System.

"4. Consideration of proposals and suggestions of interest to the business from people outside of the Bell System.

"5. Consultation and advice to other departments and associated companies on radio, such as broadcasting, ship-to-shore, harbor craft, aircraft and police systems.

"Special Representative, Mr. B. A. Kaiser, has the following responsibilities:

"1. Development and administration of the Standard Operating Agreement with railroads; and the preparation, negotiation and administration of specific contracts thereunder.

"2. Preparation, negotiation and administration of contracts with railroads for repeaters and loading coils.

2648 "3. Negotiation, administration and assistance in the preparation of special contracts with the War Department, Navy Department, Coast Guard and Forest Service of the Federal Government and, in general, maintaining points of contact with Federal departments requiring service.

"4. Preparation, negotiation and administration of contracts with oil, natural gas, and pipe line companies.

2649 "Special Representative, Mr. C. F. Craig, has the following responsibilities:

"1. Development and administration of Bell System contracts with telegraph, power and light companies.

"2. Development of new types of telephone service, and wider usefulness of existing services and facilities, as for example, teletype service.

"Special Radio Representative, Mr. L. E. Whittemore, who heads a new department established January, 1931, has the following responsibilities:

"1. Maintains official point of contact between the Federal Radio Commission and the Bell System.

"2. Co-ordinates Bell System relations with all Government agencies as regards use of radio.

"3. Prepares and handles all applications for radio permits.

"4. Represents the Bell System at conferences and conventions of communication companies with radio interests.

"Under my orders and supervision the work done by the Department of Operation-C has been reviewed for the years 1923 to 1931, inclusive, and the expenses of these years apportioned to two classes, namely, 'Expenses on account of License Services' and 'Other Expenses (including general supervision)'.

2650 "In making this review the work done by each department head as described above was considered separately and all of the work was found assignable to 'License Services' except that portion in charge of Mr. Miller, Staff Engineer, which related to contracts and licenses for the manufacture, sale or use outside the Bell System under patents owned or controlled by the American Telephone & Telegraph Company. The costs of this latter work were assigned to 'Other Expenses'.

"The expenses of Assistant Vice President, Mr. C. O. Bickelhaupt, and his secretary have been assigned to 'License Services' and 'Other Expenses' in proportion to the total

assignments to these classes for his division heads. Expense representing time paid for but not assigned has been allocated to 'Other Expenses'.

"My own expenses and those of my secretary I have assigned 75 per cent to 'License Services' and 25 per cent to 'Other Expenses,' the latter including certain amounts covering supervision of general activities of the company which are properly allocable as costs of rendering License Contract Service.

"Summarizing these apportionments gives the following results:

2651

"Apportioned to License Services:

1923	$213,551, or 88 per cent.
1924	209,788, or 87 per cent.
1925	211,565, or 87 per cent.
1926	240,549, or 88 per cent.
1927	233,029, or 88 per cent.
1928	254,250, or 89 per cent.
1929	268,793, or 85 per cent.
1930	277,792, or 81 per cent.
1931	273,631, or 83 per cent.

"Apportioned to Other Expenses (including general supervision):

1923	$28,189, or 12 per cent.
1924	31,281, or 13 per cent.
1925	32,024, or 13 per cent.
1926	31,326, or 12 per cent.
1927	32,642, or 12 per cent.
1928	32,468, or 11 per cent.
1929	48,934, or 15 per cent.
1930	63,288, or 19 per cent.
1931	54,016, or 17 per cent.

"I consider all of the above fair and reasonable.

"Having determined the amount of expenses assignable to 'License Services' for the respective years, I than had

2652 these expenses apportioned between those for the benefit of the Long Lines Department and those for the

benefit of the associated companies, including the Bell Telephone Company of Canada.

"Such apportionment cannot be exact because practically all the work of the Department directly or indirectly affects both the Long Lines Department and the associated companies. However, the ratio which the plant investment of the Long Lines Department bore to the total plant investment of the Associated Companies, including the Long Lines Department and the Bell Telephone Company of Canada, will furnish a basis for such apportionment. The Long Lines portion so determined was as follows: 1923, 6.0 per cent; 1924, 6.1 per cent; 1925, 5.9 per cent; 1926, 5.7 per cent; 1927, 6.2 per cent; 1928, 6.8 per cent; 1929, 7.6 per cent; 1930, 9.0 per cent; 1931, 9.5 per cent.

"The total operating revenues, Accounts 501 to 526, inclusive, of the Long Lines Department compared with the same total revenues for the associated companies, including the Long Lines Department and the Bell Telephone Company of Canada, shows the Long Lines portion of the total percentages to be the following: 1923, 7.7 per cent; 1924, 7.1 per cent; 1925, 7.2 per cent; 1926, 7.1 per cent; 1927, 7.2 per cent; 2653 1928, 8.1 per cent; 1929, 8.7 per cent; 1930, 8.6 per cent; 1931, 8.4 per cent.

"Both the plant investment and the revenue relations reflect activities of Department of Operation-C and my supervision thereof and in my opinion a composite ratio should be made of the two relations by taking their arithmetical mean, the result being as follows: 1923, 6.9 per cent; 1924, 6.6 per cent; 1925, 6.6 per cent; 1926, 6.4 per cent; 1927, 6.7 per cent; 1928, 7.5 per cent; 1929, 8.2 per cent; 1930, 8.8 per cent; 1931, 9.0 per cent.

"In my opinion the composite ratio just stated is the most appropriate for apportioning to the Long Lines Department the expenses of Department of Operation-C which have been assigned to the 'License Services' for the years 1923 to 1930, inclusive. For the year 1931 the composite ratio is, in my opinion, also appropriate for all the expenses except those

incurred by Mr. Whittemore's department which was established in that year.

"The expenses of that department, including a pro rata portion of Mr. Bickelhaupt's administration, should, in my opinion, be apportioned two-thirds to the Long Lines Department and one-third to the associated companies, including the Bell Telephone Company of Canada. If various other possible bases for apportionment such as expenses, stations, employees, were taken there would be little difference in the result.

"Using the composite ratios already stated and applying the special correction for the year 1931, gives the following amounts assignable to the Long Lines Department: 1923, $14,735; 1924, $13,846; 1925, $13,963; 1926, $15,395; 1927, $15,613; 1928, $19,069; 1929, $22,041; 1930, $24,446; 1931, $39,433.

"The balance of the expenses in each year were assigned to the associated companies, including the Bell Telephone Company of Canada, with the following results: 1923, $198,816; 1924, $195,942; 1925, $197,602; 1926, $225,154; 1927, $217,416; 1928, $235,181; 1929, $246,752; 1930, $253,346; 1931, $234,198.

"The services of the Department of Operation-C are applicable to the Chicago area as defined in this case. A basis for an allocation to that area is, in my opinion, the ratio which the plant investment for the Chicago area bears to the total plant investment for the associated companies, including the Bell Telephone Company of Canada. This is as follows: 1923, 5.6 per cent; 1924, 5.4 per cent; 1925, 5.2 per cent; 1926, 5.2 per cent; 1927, 5.2 per cent; 1928, 5.3 per cent; 1929, 5.3 per cent; 1930, 5.1 per cent; 1931, 5.1 per cent.

"The percentage relation which the total operating revenue, Accounts 501 to 526, inclusive, of the Chicago area bore to the same total revenue for the associated companies, including the Bell Telephone Company of Canada, was as follows: 1923, 7.0 per cent; 1924, 6.8 per cent; 1925, 6.5 per cent; 1926, 6.3 per cent; 1927, 6.2 per cent; 1928, 6.2 per cent; 1929, 6.5 per cent; 1930, 6.3 per cent; 1931, 6.2 per cent.

"Since both the plant investment and the revenue relations

reflect activities of the Department of Operation-C, a composite ratio of the two relations is in my opinion the best measure. The arithmetical mean of the two percentages is as follows: 1923, 6.3 per cent; 1924, 6.1 per cent; 1925, 5.9 per cent; 1926, 5.8 per cent; 1927, 5.7 per cent; 1928, 5.8 per cent; 1929, 5.9 per cent; 1930, 5.7 per cent; 1931, 5.7 per cent.

"However, before making this apportionment, I de-
2656 ducted from the total so assigned for the year 1931 the portion of Mr. Whittemore's expenses and administration thereon included therein. The amount thus deducted is $8,559.

"Applying the composite ratios above stated to the totals found applicable to the associated companies, including the Bell Telephone Company of Canada less the adjustment for radio, gives the following as the amounts of expense of Department of Operation-C applicable to the Chicago area: 1923, $12,525; 1924, $11,952; 1925, $11,659; 1926, $13,059; 1927, $12,393; 1928, $13,640; 1929, $14,558; 1930, $14,441; 1931, $12,862.

"Regarding the allocation to the Long Lines of a portion of the expenses of the General Service Bureau, the cost of the activities of the several company departments served by that Bureau pertain (in so far as Long Lines are concerned) to one or more of the following factors:

"Plant Investment; Employees; Expenses; Revenues.

"An allocation of the General Service Bureau costs to the Long Lines should therefore be made on the basis of a composite of these four factors; namely, the ratio that the
2657 Long Lines composite of these items bears to the total of the same items for all associated companies, including the Bell Telephone Company of Canada and the Long Lines. An allocation of the balance of the General Service Bureau costs to the Chicago area should similarly be made on the basis of the composite of the above factors plus stations (which is a comparable factor) in the ratio that the Chicago area composite ratio bears to the total composite ratio of all

associated companies and the Bell Telephone Company of Canada."

2658 Mr. Blackman: Now, as a part of our stipulation, it is agreed that I should state on the record that the ratio figures in so far as they come from revenue, plant and the other matters dealt with in the Crunden exhibits, come from those same exhibits, and that the defendants make the same objection to this sheet that they have made to the others, on the ground that the figures underlying the ratios have not yet been proven in evidence.

CHARLES A. HEISS, called as a witness on behalf of the plaintiff, having been previously duly sworn, resumed the stand and further testified as follows:

Direct Examination (Continued) by Mr. Blackman.

May 18, 1932.

This sheet is an allocation to the Chicago area of the fair proportion of the expenses of the Legal Department for the years 1923 to 1931, incurred in rendering license contract services.

(Sheet marked Plaintiff's Exhibit A-160 for identification.)

The sheet was prepared at my direction and under
2659 my supervision. The figures appearing in columns 1 and 2 were taken directly and without change from the books of the company. The figures appearing in column 3 were given to me by Vice President Bracelen, who is in charge of the department. I had no responsibility for developing these figures. He developed them and gave them to me. From that point on, I proceed in this exhibit in precisely the same manner that I have proceeded in the five or six exhibits that I described yesterday. The columns are numbered in the same way, and each column stands for the same general thing. The only ratio used in making allocations on this exhibit is that

of total telephone revenues, as stated in the footnote
2660 appearing on the exhibit. Mr. Bracelen selected that ratio as the basis.

I think that ratio is a fair and proper ratio to use for allocating expenses. Assuming the correctness of the deductions shown in column 3, in my opinion the figures shown in the last column to the right of this sheet allocate to the Chicago area of the Illinois Bell Telephone a minimum amount as its fair share of the cost of the Legal Department of the American Telephone and Telegraph Company as related to the business of that Company.

"Mr. Blackman: If your Honor please, we have an understanding with counsel for the defendants that Mr. Bracelen need not be called to substantiate these figures, provided that certain facts connected with them be put in evidence. We have examined into it among ourselves, out of court. One of the facts that the defendants wish to establish is that
2661 these figures contain payments for patents. Part of the expense of the Legal Department is outright payments to outsiders for patents."

I can tell whether payments for patents are included in the figures that appear in column 2, and carried forward to column 4.

Mr. Goldstein requested the cost of patents purchased from persons outside of the business. Now, the figures which I have here include also the patents which the American Company purchased from the Western Electric Company, and the small amounts paid from year to year as honorariums to men in the business who developed patents. The second group is not large, the amount is not large, but we are giving him more than he asked for.

"Mr. Goldstein: The total figure will be satisfactory. I mean, I thought at first it only included the outside, but if you give us the total patent purchases expense, that will be satisfactory.

"The Witness: If you are satisfied with the total fig-
2662 ure, I can give you that. For the year 1923, the amount —or cost of the patents purchased, that is, the actual

cost paid for patents, including those purchased from the Western Electric Company, and the honorariums, was $180,696."

For the year 1924, $220,417; 1925, $137,002; 1926, $80,138; 1927, $155,445; 1928, $314,570; 1929, $77,818; 1930, $298,976; 1931, $136,692—that is exclusive of the expenses incurred in connection with the purchase and litigation of the patents.

For the year 1923, legal expenses in connection with purchase, litigation, and so forth, of patents, $157,621; 1924, $129,691; 1925, $151,239; 1926, $196,848; 1927, $218,680; 1928, $185,627; 1929, $192,921; 1930, $220,199; 1931, $389,788.

Those figures that I have just read include the cost of litigation of patents as well as the cost of acquiring. These
2663 are the figures, in so far as we have been able to keep a record of those expenses. In this sheet I have taken the cost of those patents, and have expensed them. That is the term that we accountants use in charging them up in the year when this expense was incurred.

I followed that method of accounting, because, in my opinion, it is a conservative procedure. We have followed that method, to the best of my knowledge throughout the history of the business, but I might say that I can speak only of the years during which I was Comptroller. I know during the past ten years, or twelve years, we have expensed all patents. At the present time there are no patent charges in our capital accounts.

In so far as the amount to be allocated to the City of Chicago is concerned, whether we expensed these patents, or capitalized them would make very little difference
2664 year by year over the period. Of course, the amounts which I have read vary slightly from year to year, and if you include the expenses of litigation, and the legal expenses in connection with acquiring patents, with the direct amounts, with the amounts paid out directly for patents, the amounts through the years run along fairly uniform, increasing as the size of the business increases.

Now, I might add that in the uniform system of accounts of the Interstate Commerce Commission which is, of course, my

guide in keeping my accounts, question and answer 176 says: "The character of the patent purchased should determine whether or not the cost of any portion thereof should be charged to account 203"—that is, the capital account. They say further: "Any amounts paid for patents having an estimated service life of less than one year, patents of doubtful service value, patents in an undeveloped state, patents of small cost, and similar expenditures on account of patents, may be charged direct to account 675, Other General
2665 Expenses." And that is the account to which I charged them.

In regard to many of the patents which we buy, part of the life has already expired. In other cases we purchase ideas, speaking generally, or we purchase devices that have been developed to do a certain thing, but before that thing, that particular thing—or before that patent can be used in the telephone business it is necessary to do a very considerable amount of research work and adaptation. It may develop in the course of the study of the patent that it will not do in the telephone business what we had hoped it might do. Many of the patents, therefore, are in an undeveloped state. The individual cost of these patents may not be small, but in many cases it is. We have eleven thousand patents. Some
2666 have been small, and some have been substantial. Now, I do not know as to each what the result was, but taking the patents generally, the character of the patents is such that it is a more conservative treatment to charge them to expenses than it would be to capitalize them. Now, assume that these patents, we will say, had an average remaining life of ten years at the time purchased, and take into consideration that some of the patents are found (before the end of the seventeen-year period for which the grant was given) not to be useful in the business. Let us take the ten-year life, and amortize our total patent cost on a ten-year basis. Uniformly over the years the charges for amortization in my opinion would be more, or rather, would be equal—would at least be as much as the charges which I have put into my accounts by charging them directly. Now, if we capitalize

them, we would carry in our capital accounts a capital figure on which we should be entitled to a fair return. Under our present method of treatment, we have charged them to expenses; no amounts are capitalized; and the expenses are fairly uniform from year to year; and the practice, I
2667 believe, is the more conservative of the two practices that are available for their treatment.

During the period 1923 to 1931, the total direct payments for patents were $1,601,754. The legal expenses in connection with purchase, litigation and so forth were $1,842,614, or a total of $3,444,368. Now, if we took a seventeen-year period and added to this amount certain engineering investigation costs of patents, I think our figure to the best of my recollection is about $6,400,000.

"Mr. Blackman: I offer the Legal Department allocation in evidence, which has been marked Exhibit A-160, subject, of course, to the objection of the defendants as to the Crunden exhibits, the figures taken from the Crunden exhibits.

"Mr. Haight: We would like to reserve any objection we may have until the conclusion of the cross-examination.

"Judge Wilkerson: Very well."

2668 These three sheets are an allocation to the Chicago area of a fair proportion of the taxes of the American Company for the years 1923 to 1931, inclusive.

(Sheet marked Plaintiff's Exhibit A-161 for identification.)

These sheets were prepared at my direction and under my supervision. The figures appearing in column 1 I have taken from the books of the Company. The figures in column 2 are an allocation of taxes to so-called non-license activities, made by me. The figure in 1923 of $65,335, appearing in column 2, is 5 per cent of the total of the figure appearing against New York Excise, New York Franchise, Federal Capital Stock, and Stamp and Miscellaneous. I made the deduction of 5 per cent for the same reason as stated in my testimony yes-
2669 terday for the Service Bureau, and for those other general items and in respect of any activity which the American Company might carry on which was not of benefit to the Long Lines and the associate companies.

"Note in connection with the year 1923, and the same is true for other years, the last item reading, "Less amount excluded from statement of estimated costs", column 1, $14,911, and the same amount in column 2. In setting up this exhibit, I endeavored to reconcile it with the exhibit which I used in the Ohio rate case and which was furnished by counsel for the defendants. In that exhibit I deducted directly certain items amounting to $14,911. I also made other deductions—or, I also gave further consideration to the taxes in this general over-all blanket deduction which I made from expenses in that case. But, having deducted the $14,000 in that case, and that deduction having been carried through into this exhibit, I felt it proper to show that deduction here, and to deduct it from

the $65,000, leaving a net deduction from the $2,982,657
2670 of $50,424. In other words, my $14,000 is really included in the $65,000. If I speak of my taxes before deducting the $14,911, then my deduction is $65,336. If I speak of my taxes after making the Ohio deduction, then my deduction in column 2 is $50,424. Now, the figures in column 3 are the difference between those appearing in column 1 and those appearing in column 2, and represent the amount which we consider allocable to the associated companies, including the Bell of Canada and the Long Lines. The figures in column 3 are merely column 1 figures—the remainder I get by deducting column 2 from column 1. In column 4 I have developed ratios. The ratio in the left hand section of column 4 is a composite ratio of plant, employees, expenses and telephone revenues. That is the same composite percentage which I

developed and dealt with yesterday. And I consider that
2671 ratio applicable because taxes have a relation to all of the activities of the business. The fifth column shows the amounts remaining after deducting the amount allocated to the Long Lines in column 4, but let me add here that we start with the taxes of the Company after having in the first instance excluded from the amount all of the taxes applicable to the Long Lines, and charged in their accounts in our routine day-to-day accounting; so that this allocation is an additional allocation to the Long Lines of its portion of the

general department taxes, or the taxes belonging to the department giving a license contract service, to give to the Long Lines its fair proportion of those costs.

The Long Lines Company, as an operating telephone company, has certain taxes of its own; and they are all charged against it, and none of them are included here. Those
2672 taxes run into several million dollars in a year. Having developed these figures here in column 5 for allocation to the associated companies, including the Bell of Canada and excluding the Long Lines, I have made an allocation to the Chicago area, and in doing so it was necessary to use a different treatment in respect of the various taxes. Where the tax was a common tax and related to the associate companies, including the Illinois Bell and the Chicago area, I have used the composite ratio, plant, employees, expenses and total telephone revenues, melding stations.

That is the same ratio that I used yesterday to allocate between the associate companies, excluding the Long
2673 Lines, and the Chicago area of the Illinois Bell. I used that because I felt that that was a proper ratio, since taxes related to the entire business. I explained that yesterday. It is the same ratio developed in the same way, and for the same reasons.

Going back to column 1, the first line is, Instrument, Illinois Bell. I will state very briefly what that is.

During the period that the American Company owned the instruments, the contracts generally provided that any taxes in respect of the instruments, that is, the receiver and transmitter, which were assessed on that property, should be paid by the associate companies. But in the case of the contract with the Illinois Bell Company, and I think the Pacific Telephone Company, and the Cincinnati and Suburban Bell Telephone Company, there was a provision that any such taxes could be billed to the American Company, and those companies followed that course. They arrived at what was considered the amount of taxes applicable to the instruments

in the properties here in Illinois, and billed that amount
2674 to the American Company, and we paid the bill. We paid what they said was their instrument tax. And to that extent the Illinois Bell, the Cincinnati Company, and one other company that I mentioned, had a little preferential treatment over the other associate companies.

I might add that we have shown here separately the amount of the Illinois Bell tax billed to the American Company, and in the second line we have the amount billed by the other companies which had this special arrangement in the license contract. Now, the amount of taxes billed to the American Company by the Illinois Bell in 1923 was $58,913. I have allocated that against the Illinois Bell, and have allocated to the Chicago area 70.7 per cent, which is the ratio of the
2675 instruments in the Chicago area that year to the total instruments in the possession of the Illinois Bell.

In the next line is the word "Other". That represents the tax which we reimbursed to other companies than the Illinois Bell, and none of that is allocated to the Illinois Bell nor to the Chicago area.

My next item is Massachusetts Franchise—the Massachusetts Franchise Tax. None of that was allocated to the Chicago area. That is a tax in connection with doing business in Massachusetts.

The next item is New York Excise Tax, $84,503. I have allocated a part of that to the Chicago area.

2676 The next one is the New York Franchise Tax. I have allocated a part of that to the Chicago area. The New York Excise tax is an excise tax which we pay in the State of New York, and the New York Franchise tax is a tax which we pay in the State of New York, because the home of the American Company is in the State of New York; it must have a home somewhere, and New York happens to be the home State, and the State which assesses the tax for our being there. Now, the business of the Company, of course, extending over the United States to all of the associate companies, it is, in my opinion, proper to allocate a part of the New York Excise tax, or New York Franchise tax, to the Chicago area, and in

that allocation I have used the composite ratio. That is on the assumption that I would have to have a corporation to carry on these services, and that corporation would have to pay taxes to exist as a corporation.

2677 The portion allocated to the Chicago area of the New York Franchise and New York Excise taxes I believe would be a little more than one-third of the $59,564, or approximately $20,000, in the neighborhood of that. That is just a rough approximation. I have not figured it out. I have all of the figures there, however, to make the computation.

The next item is Federal Capital Stock tax. The Federal Capital Stock tax in 1923 was $604,736. I have allocated to the Chicago area those three taxes and one other, together. The total is the $59,000 that appears in the last column.

2678 There are four items. A small item of stamp and miscellaneous taxes is included in the credit which I have allocated to Chicago on the composite ratio, giving $59,000—or producing $59,564. I have allocated all of that amount of Federal Income Tax to the associate companies, and the Bell of Canada, and the Long Lines, for the reason that all of that tax, in my opinion, was allocable to those companies.

We made a study and we found that, after assigning against each classification of revenues, the Long Lines revenue, the revenue from the license contract, and other revenues, we had more deductions in the miscellaneous group of revenues than we had taxable income, and that exhausted, of course, that revenue, and the remainder of the deductions, in order to be conservative here, were applied against the license contract sources,—the income coming from license contract sources. After we gave the license contract sources all of the deductions which belonged in that category, we gave an additional deduction for the balance of the deductions which we could not use up in connection with the non-license revenue. That

2679 is, we paid a great deal more taxes than are shown here as income taxes to the government. . . .

Now, the effect of that is shown, if you look at the years 1929 and 1930, where, as a matter of fact, a red figure appears.

which figure is in part due to the fact that the deductions applied against the revenue from license contract sources in conjunction with adjustments, were sufficient to eliminate all of the taxable income in connection with our license contract activities.

The American Company paid in the year 1923 approximately three or four million dollars income taxes. I do not have any figures with me, and I hesitate to quote a figure definitely. That payment was on the amount due under the technical terms of the Income Tax Law, after deducting a large amount of bond interest which we had. And what I have just said is, in effect, that in determining the tax in connection with the license contract revenue, I have

2680 given credit for a considerable amount of the bond interest in arriving at the amount of the taxes allocable. And, I have thereby reduced the amount of the taxes shown on those sheets, which I charge as an expense of the license contract. I have proceeded in precisely the same way in the years 1923 to 1927, inclusive.

. . . . . .

In 1928 the capital stock tax shows a credit. In 1927 it was only about one fifth or one sixth as much as it was in 1923. That is because the capital stock tax passed out of existence, I think in 1926. This small payment in 1927 was a hold over payment. Then in 1928, when the returns were finally settled with the government, or an agreement was reached as to what we should finally pay, we received a credit, and that is reflected in 1928, because that is the year in which it appears on my books.

2681 The Federal Income Tax had been reduced to very small proportions by 1928, and in 1929 and 1930 I show credits for Federal Income Tax. These are due to three factors. We sold the instruments in 1927, and in connection with the sale of the instruments reduced the license revenue or the license contract charge, 2 per cent. We had also previously made another deduction of one-half per cent, so, as compared with 1923, we were collecting 2 per cent, and 1½ per cent, in the later period, as against the 4 in the earlier period.

Now, then, in the later period also we had other interest

deficiencies, bond interest deductions. Then, as I have already stated, some small part of the credit in the years 1929 and prior is due to adjustments on our tax accruals. We account for taxes on an accrual basis, and from time to time as we receive advices from the government as to the taxes payable under a particular return, we review our accruals and adjust the amount in our tax reserves; and to the extent that such adjustments were in the picture—they were not large as to amount—they are reflected in the red figure in the years 1928 and 1929. With the exception of these credits that appear in 1928, 1929 and 1930, I have proceeded in those years in the same manner in which I have proceeded in the years preceding.

In my opinion, the figures which appear in the last column to the right on these three sheets represent a minimum amount of allocation to the Chicago area as representing its fair share of the expenses of the American Company for taxes, in connection with the operation of its license contract.

Mr. Blackman: I offer the sheets, Plaintiff's Exhibit A 161 for identification, in evidence.

Mr. Haight: We wish to make the same reservation of our objection, if your Honor please.

Judge Wilkerson: Very well.

These sheets, Plaintiff's Exhibit A 162 for identification, were prepared at my direction and under my supervision.

The first of the two sheets is a statement of the number of telephone instruments, receivers and transmitters charged to associate companies, Long Lines, and the Chicago area during the years 1923 to 1927, and when I say "charged" I use that term in the technical sense, that is, on our books in New York the instruments are set down company by company and charged out against the companies to which you have delivered them. And they are there charged out against the particular company that is in possession of them for the time being. This sheet shows no money figures. These are instrument figures.

The figures shown in the first column were taken from the books of the American Company. Those in the second column

were also taken from the books; that is, the first column shows all of the receivers, transmitters and induction coils
that we had issued to the various operating units of the 2684 Bell System. Column 2 shows the very small amount that is, .06 per cent, which was charged to the Long Lines. They practically use none of these instruments, only a few head sets for Central Office use. Column 3 is just the balance after deducting the Long Lines figure. Column 4 shows the instruments in the Chicago area; that is, the actual number as shown on the reports of the Illinois Bell Telephone Company for the Chicago area, for the years indicated. And that is a percentage of 6.6 per cent in 1923, of the total instruments of the associate companies, excluding Long Lines.

The figures to the right are merely the Illinois Bell figures for the whole Company, and the relationship between the Chicago area figures and the Illinois Bell. The figures 2685 in column 4 are the instruments which we have charged out against the Illinois Bell Company on the American Company's books. The American Company's books do not show a charge out for instruments to the Chicago area, but the Illinois Bell Company's books do show that; and their reports to us show what their books show. So all of these figures that we are dealing with here are merely book figures, which I have not changed or modified in any way.

"Mr. Blackman: I will offer the first sheet, Plaintiff's Exhibit A 162 for identification, in evidence.

"Mr. Haight: May we again make the usual reservation with reference to this exhibit?

"Judge Wilkerson: Very well."

This second sheet of Plaintiff's Exhibit A 162 for identification was prepared at my direction and under my supervision. It is an allocation to the Chicago area of its 2686 fair proportion of instrument expense incurred by the American Company during the years 1923 to 1927, inclusive, and by "instrument expense" I mean both the expense of repairs and the expense of depreciation. The total figures shown in column 1 were from the books of the American Company.

The percentage .06 shown for the year 1923 in the left section of column 2, is the same percentage which was shown on the preceding sheet. I have just taken it bodily from the preceding sheet. It was the actual instruments; it represents the percentage of instruments actually held by the Long Lines.

I then proceeded in the same manner in which I have proceeded generally in my other allocation exhibits, to allocate to the Chicago area its fair share. Those figures are shown in the last column to the right. In my opinion, they show a minimum amount to allocate to the Chicago area for its
2687 fair share of the expense of the American Company in connection with maintenance and annual depreciation charges of this class of property.

The table below is a statement of the depreciation expense included in the figures appearing in the upper half of the sheet. Those figures are also taken from our books directly and without change. The same is true of the figures in columns 1 and 2 of the table above. Of course, I have stated that we have no allocation on our books of figures to the Chicago area. And the figures in column 4, for allocation to the Chicago area, come from the figures on the preceding sheet which I have previously testified to. The figures for
2688 the Long Lines are a computation. This paper was prepared under my supervision.

(Paper marked Plaintiff's Exhibit A-163 for identification.)

The statement is a computation showing the fair allowance or credit to the American Company, against its license revenues received from the Chicago area, in recognition of the American Company's furnishing the instruments used in that area. These figures here are not in addition to those that were just put in, with regard to the instrument expenses. That is, they are not, in addition in the sense that these figures shall be added in their entirety to the figures which I have already given. Some of the figures already
2689 given are included in these and should be deducted in determining the total amount; or, putting it another way, the figures which I have in the record are one approach

to the problem, and this statement is another approach to the same problem—in meeting the same problem. The figures in the record represent the actual dollar costs to the American Company as shown by their books. This sheet shows what is, in my opinion, a fair allowance to be made on the basis of all factors concerned.

Taking the first line, average current cost: that is the current cost of the instruments to the American Company, taking the instruments in service in 1923. New instruments,
purchased from the Western Electric Company, would
2690 have been this amount; that is, if an equivalent number of instruments had been purchased, they would have cost this amount, equivalent to the number here stated. The number here stated are those in use by the Illinois Bell in the Chicago area. And so I have just applied to those actual figures of instruments in use, or rather receivers, transmitters and induction coils in use, the figures of what those classes of apparatus were costing the American Company in the year in question, that is, its actual payments to the Western Electric Company. Those payments were somewhat, even substantially, lower than the published prices of the Western Electric Company. I am taking here the actual payments made by the American Company. This is based on the actual prices paid by the American Company in that year.

2691 Line 2 is designated as Actual Depreciation, 8 per cent of column 1. I took the 8 per cent figure from Plaintiff's Exhibit A-32, pages 8 and 9, in the record in this case, as representing the actual depreciation in the instruments in question.

Line 3 is the difference between line 1 and line 2. It is the current cost less 8 per cent Actual Depreciation. And that would be reproduction cost new, less actual depreciation.

In line 4 I have Depreciation Expense. That is the annual charge for depreciation. That is the same rate that I have used in the computations already in the case, and taken from the books of the American Company. It is the rate which it had used for some time previous to this period.

2692 In line 5 I have assumed that the American Company

should receive a return of 8 per cent on the amount invested, or on the amount represented by these instruments, at current cost, less depreciation of 8 per cent. In other words, line 5 is an application of 8 per cent to the figures in line 3. Line 6 is merely a total of 4 and 5.

I have line 7, Margin for Additional Instruments. As to that: in addition to the instruments actually in the Chicago area in these years, it was necessary for the American Company to maintain the reserve supply, and that reserve supply was considered at 6 per cent of the amount of instruments actually in the Chicago area. I have taken 6 per cent. of line 6. I might have carried the computation through, but in the interest of simplicity I have just added 6 per cent.

Line 7 is 6 per cent of line 6. As a matter of fact, those
2693 instruments that are held in reserve are all new instruments. And this method of treatment is, in effect, considering them as of the same depreciated character as those that were in the hands of the Illinois Bell.

Line 8, Instrument Repairs; that comes bodily from my preceding exhibit. The last line on this sheet, line 9, purports to show the result that I am after. In my opinion, that line shows a minimum amount that should be allowed for the use by the Chicago area of the instruments furnished to it by the American Telephone and Telegraph Company, and the service which the American Company gave it in connection with those instruments.

"Mr. Blackman: I offer the exhibit, A-163 for identification, in evidence.

"Mr. Haight: We would like to make the same reservation, if your Honor please."

(Sheets marked Plaintiff's Exhibit A-164 for identification.)

2694 These sheets were prepared at my direction and under my supervision.

They show the average cost of the funds used in the business of the American Telephone and Telegraph Company for the years 1923-1931, inclusive. The figure showing that fact

is the last figure at the lower right hand corner of the statement. It is 6.87 for the year 1923. I started with the capital stock of the Company. The average amount outstanding for the year appears in the first column of figures. In the second column are shown the dividends paid on that stock. The third column shows the percentage relation of the dividends to the average amount outstanding during the year. The second line shows the capital stock premiums, total premiums re-
2695 ceived by the American Company up to the end of 1923.

There being no charges made directly on these premiums, I have no figure for the second column, nor the third column; but, of course, the item of capital stock premiums must be taken into consideration. That is, in effect I have treated this as if I got that money for nothing. But it must be considered in conjunction with capital stock. The third line shows the total for the capital stock and capital stock premiums.

The last column to the right shows the average rate stated in per cent on the total money in the business, received from capital stock and capital stock premiums. And that produces the rate that I have put down there as the rate the money cost us: 8.19. Now, in the fourth line, you see Surplus Unappropriated and Appropriated of the Company, the average amount on the books of the Company for the year 1923 being $110,176,041. I show no figure in the second column, treating this surplus as not costing the Company anything directly by way of fixed charges, or capital payments. I have no
2696 percentage in the last column.

Now, taking the total of the capital stock, capital stock premiums and surplus, the facts are shown in the fifth line. That is 7.17, which is the average rate paid, per cent, on our capital stock, including premiums and surplus equity.

The next line shows the facts as regards capital stock installments. The average amount in the business during the year was $19,431,657. On those installments we paid interest of $1,444,819, or at the rate of 7.44 per cent.

The next item is Funded Debt. The average amount in the business during the year is shown in the first column of

figures. The interest and amortization charges applicable to that debt for the year 1923 are shown in the second column. The third column shows the average rate paid in per cent on bond money during the year—that is, on funded debt during the year 1923. Then the last item, Loans from Associate Companies, shows the average amount of money we had in that year from our associate companies, total interest in
2697 dollars paid thereon, as shown in column 2, and, in column 3, the average rate paid per cent.

Now, that last item is surplus funds which the associate companies left with the American Company, or, in other words, loaned to the American Company, pending their need for funds at a later date. All of these figures shown in columns 1 and 2 on this sheet come directly from the books. That is, they can be derived from the books. These figures are averages, and, of course, the books do not show averages; averages must be computed from the figures on the books. That is the only extent to which I have made any computations from the books. Of course the items of interest and amortization charges require us to bring together the various accounts on the books, of interest and amortization—or debt discount and amortization charges. That is all I have had to do, purely an arithmetical procedure with regard to the actual figures shown on the books. Anyone desiring to do so can take this statement, and go to the books, and make identically the same computations which I have made.
2698 Now, the average total funds in the business in 1923 were $1,135,740,062, and on that, dividends, interest and amortization charges amounted to $78,037,037, or an average rate of 6.87. I have made up a similar sheet for each of the years following 1923. The interest rate is somewhat lower there. That works out for the last year, 1931, as 6.42.

The lowest rate is for the year 1930. At that time we had used in the business something over $3,000,000,000. And our dividends, interest and amortization charges were
2699 $195,000,000. The capital stock premiums in that year were in excess of $264,000,000, the surplus included here

in excess of $381,000,000. I computed all of these sheets in precisely the same way, so that the information is the same in each case.

"Mr. Blackman: I will offer the sheets, Plaintiff's Exhibit A-164 for identification, in evidence.

"Mr. Haight: The same reservation, if we may have it."

In these sheets, in developing the cost of money, I have included surplus. That is, I have included the surplus as without direct cost. I treated it as if the surplus had cost us nothing. I have made another calculation, based on
2700 excluding the surplus. This is the sheet where I have developed those costs.

(Sheet marked Plaintiff's Exhibit A-165 for identification.)

I have developed them correctly to the best of my knowledge.

"Mr. Blackman: I will offer that sheet, Plaintiff's Exhibit A-165 for identification, in evidence.

"Mr. Haight: The same reservation."

If it were desired to determine the cost of money in my Exhibit A-164 on the basis of excluding the surplus, and not including it, all I would have to do would be to substitute the figure shown in the right hand column for each of the years on this sheet, for the figure shown in the lower right hand column on each of the sheets of Exhibit A-164. It merely means the substitution of the figure opposite the particular year in the right hand column of this last sheet, for the figure in the lower right hand corner of the sheet of Exhibit A-164 of the corresponding year.

2701 Exhibit A-166 for identification was prepared at my direction and under my supervision. It shows an allocation to the Chicago area of cost of carrying investment in telephone instruments used in rendering license contract services. This is an actual cost computation and I should add, in regard to the heading, telephone instruments used by the American Company in rendering license contract services. The figures were taken from the books of the Company, directly and without change, excepting where the figures are computations.

The figures for the year 1923: the figure for total investment is an actual book figure, and the figure for depreciation reserve is a book figure. The same is true as to other years. The remainder of the figures are computations based on book figures, merely an arithmetical computation from the
book figures. No judgment, or anything of that kind,
2702 enters into that. The figures in column 1 are the aggre-
gate charges at 6.87, or the rates that have been used for the various years applied to the difference between the total book investment of the American Company, and the depreciation reserve appearing on the books. That is, the figures in column 1 show the total cost of carrying the investment in the instance which we are considering. And that total cost is obtained by applying the rate figure of carrying charges, in the case of 1923, to the figure of $16,318,631. 6.87 is a percentage taken from the exhibit just introduced.

I have proceeded in the other columns to the right to allocate to the Long Lines and to the Chicago area on the same
basis that I followed in the exhibits which I put in yes-
2703 terday. I used the same general method. I used a ratio
of .06 per cent for Long Lines. That is the percentage of instruments in possession of the Long Lines to the total of all instruments in the hands of the Company—the same percentage I testified to previously today. And the same basis was followed in arriving at the allocation to the Chicago area; it is also based on instruments allocable to the Chicago area. It is the same figure that I dealt with on the other exhibit this morning.

I have proceeded in precisely the same way with regard
to each of the following years. I start with 1927 on this
2704 sheet because the instruments were sold at the end of
1927. In my opinion, the figures that appear in the last column to the right on this sheet show a minimum amount to be allocated to the Chicago area of the Illinois Bell Telephone Company as its fair share of the expense of the American Company in carrying the cost of its investment in the instruments. And it represents the cost to the American Company of carrying the precise number of instruments that

were delivered to or held for the benefit of the Chicago area of the Illinois Bell Telephone Company.

"Mr. Blackman: I offer Plaintiff's Exhibit A-166 for identification, in evidence."

These sheets, Plaintiff's Exhibit A-167 for identification, were prepared at my direction and under my supervision. The sheets purport to show an allocation to the Chicago area of the cost, net, of carrying investment in real estate and office furniture and fixtures used by the American Company in rendering license contract services to the associate companies and Long Lines for the years 1923 to 1931, inclusive.

Taking the year 1923: the item, "Total Investment", is derived directly and without change from the books. That is also true of the figure shown for "Depreciation Reserve". The fourth item, "Rent", can also be obtained from the books. The third item is a computation representing 6.87 per cent of the difference between the total investment and the depreciation reserve, as shown on the two lines immediately above. That $638,374 has already been accounted for in my figures. That is the amount that is spread over the other departments of the American Telephone and Telegraph for rent.

In keeping our accounts on a departmental basis, so as to make them of value for administrative purposes, we spread the rents into the departmental expense accounts. Now, here I am excluding all those rents, and am also giving credit for any outside rents which we received on this investment. I deducted that from the figure of $859,149 in the year 1923; developed by applying our cost of money for that year against the net investment in that year.

I consider that in 1923 every dollar in the business cost us 6.87. Now, I have applied the 6.87 to the $12,505,000 in line 3 for the year 1923. Now, I have offset against that carrying charge, computed at the rate 6.87, whatever rents we received or charged in that year, in respect of the property here considered. And the difference is that figure of $220,775 in my first numbered column.

The rent that I credit here, $638,374, for the most part was

a bookkeeping charge, and, to the extent of the bookkeeping charge, it represents a rent figure covering house service, plus a 5 per cent return on the property. That is, all that the American Telephone and Telegraph Company charged out against the tenants of its New York building, these various departments that have shown their expenses before this
2707 Court, was a 5 per cent return on the money. I should change that. It represents the floor space—or the house service charges, plus the interest, plus 5 per cent on the capital stock of the building corporation. Now, to the extent that the other rentals accrued here, they are the actual rentals received.

Now, then, in column 2 I have "Non-License". I got out that as follows: for the year 1923, the last line of the data is marked "Balance". The amount in the column "Non-License" is 5 per cent of the amount in column 1. I have excluded 5 per cent of the cost for the same reason that I yesterday excluded 5 per cent of the departmental costs, because of services rendered by the American Company of benefit to others than the associate companies and Long Lines, so I have carried the 5 per cent deduction through in this computation.

Now, immediately above the line I just referred to, is the line, "Less Amount Excluded from Statement of Estimated Costs, Etc.'"; that figure is included here to reconcile these statements with the exhibits introduced in Ohio. In those exhibits, I excluded directly $14,147. That is the same
2708 figure that I spoke of before, put in here for the same purpose.

I excluded as a total $24,478, $14,000 already excluded from the figures from which I start, and $10,000 additional excluded now. I have proceeded in precisely the same way in each of the following years in these columns 1 and 2.

Column 3 is the difference between columns 1 and 2, arrived at by deducting column 2 from column 1. From that point on, I have proceeded to allocate to the Long Lines and to the Chicago area in precisely the same general way that I testified to yesterday with regard to it. In making the

allocation. I used the composite ratio of plant, employees, expenses and total telephone revenues for the Long Lines, and included in that ratio, in applying it to the Chicago area, the stations. I have proceeded in the same way for each of the years subsequent to 1923 in each of these columns 3 to 6, inclusive.

2709 In my opinion, the last column to the right on these two sheets represents a minimum amount to allocate to the Chicago area of the Illinois Bell Telephone Company as its fair share of the cost to the American Company of carrying this investment in real estate, office furniture, etc. This is the building space and the furniture and so on used by the people who were working on license contract services. This is the additional amount I figure they would have had to have over and above the rent charges that were actually made in order to meet their expenses. These amounts are not included in any other figures which I have introduced.

During the first three years shown on this exhibit, the American Company owned approximately one-half of the headquarters building, the section known as the 205 Broadway section. The portion of the building known as the 195 Broadway Building had been built earlier, and it was owned jointly by the American Company and the Western Union, 70 per cent

2710 by the American Company and 30 per cent by the Western Union. And in that case we owned stock representing our interest. In the case of the 205 Broadway Building, we actually owned the building for the years 1923, 1924 and 1925. At the end of 1925, the building was sold to the 205 Broadway Corporation, and we took stock and notes for our interest. That explains why the figures are larger in the first three years than in the later years.

I have not included in these figures anything for expenses of the 195 Broadway Company excepting as we paid rent to the 195 Broadway Corporation. But this is a computation based solely on the additional carrying charges with regard to the 205 Broadway Company, which we owned for four or five years outright, and which we then transferred to a corporation which we owned outright, plus office furniture and fixtures

The rent to which I just referred, paid to the 195 Broadway Corporation, would not appear in this statement at all. That would appear in our departmental costs. I call this
2711 "Cost of Carrying Investment in Real Estate, Furniture, Etc." The "Etc." covers such things as partitions and little odds and ends, temporary partitions, and we might have an automobile, something of that kind; trivial things.

"Mr. Blackman: I offer these two sheets, Plaintiff's Exhibit A 167, for identification, in evidence.

"Mr. Haight: We would like to reserve any objection as to these until cross-examination."

This sheet, Plaintiff's Exhibit A 168 for identification, was prepared at my direction and under my supervision. The sheet is merely a summary of the two exhibits just introduced. That is, a summary of the exhibit showing the cost of carrying the telephones, and the cost of carrying the investment in the real estate and office furniture, and combining the two under the caption, "Total Physical Property Used by the American Company in Rendering License Contract Services."

"Mr. Blackman: I offer this sheet, Plaintiff's Exhibit A 168 for identification, in evidence.

2712 This sheet, Plaintiff's Exhibit A 169 for identification, was prepared at my direction and under my supervision. It purports to show the average funds held available by the American Telephone and Telegraph Company to meet the current cash requirements of the associate companies, Long Lines, American Telephone and Telegraph Company, and for the Company's general purposes, separate from the needs of the Long Lines Department. There are two sheets.

The first sheet is my summary, and the other sheets show how I developed some of the figures on the first sheet. The first sheet shows the total amount of funds held available during the year, and the allocation of the principal amounts as between the various units. Taking my first sheet, I get the figures that appear in column 1 from the books of the Company. They are the amounts of money I have held dur-
2713 ing the year available for general use, that is, the average total amount held available during the year for all

purposes. I have made an allocation of that in the following column.

Column 2 is my estimate of the amount which the American Company would require for its immediate general purposes, and I want to be specific regarding that. When I say, "For its immediate general purposes," I mean for purposes other than performing its services to the associate companies and the Long Lines. Those amounts for the years 1923 to 1928 are small amounts, $5,000,000 and $7,000,000.

In the years 1929, 1930 and 1934 they are vastly greater. That is because from 1923 to 1928, inclusive, we made no attempt whatever to finance the Western Electric Company. There were small amounts borrowed from that Company, and we loaned, from time to time, small amounts of surplus funds to the Western Electric Company, merely as a convenience and to get the best over-all return for the System from our money. But in the year 1928 we definitely undertook to finance the needs of the Western Electric Company, and that is one reason why the amount for 1929 is considerably higher than the amount for 1928.

Now, a special situation arose in the years 1930 and 1931. The amounts in those years included here in the column for the general purposes of the American Company for non-license contract activities, are simply arbitrary amounts of cash put there to keep the amount held available for the associate companies at what, in my judgment, was a minimum figure required for the associate companies and the Long Lines.

We found ourselves, due to the business depression, in a position in 1930 where we had a very large cash balance, which situation arose from conditions which were entirely out of our control, and, instead of assigning that cash balance to the associate companies as held for them, I simply put the bulk of it into the column as held by the American Company, and have excluded the costs to the American Company in respect of that money, although I would have been entirely justified in having kept it with the funds available for the associate companies.

2715 Briefly, here was the situation: at the end of 1929 the associate companies, in reporting to the American Company their construction programs for the year 1930, advised us that the construction programs would be in the neighborhood of $680,000,000 to $700,000,000.

Now, that was the picture we had to look ahead to. We used up practically all of our money in 1929, and early in 1930 we were forced to finance, and we put out a bond issue, to carry the needs of the associate companies for the early part of the year.

Now, that money, at the rate the associate companies and Long Lines were drawing, would have been consumed by March. We were up to the task of new financing. We had issued two bond issues, one in 1929 and one early in 1930. We then put out a stock issue in May, and, in conjunction with the stock issue, there were paid into the American Company large amounts of premiums from persons who had bought the convertible bonds of 1929.

Now, everything would have been fine and we would have required that cash, but the business depression began to have its effect in the summer of 1930, and the associate companies

2716 that had told us they would need large amounts of cash began, one by one, to advise us that they would not need it, that they would not have the requirements that they told us, and, as a result, we had no immediate occasion to use the funds, and they were left in the possession of the American Company.

Now, I might very properly include those funds as held available for the companies, because they were acquired to meet the needs of the companies, but I have not done so in this statement. I have taken the bulk out, and have set them aside, and have not included in my license contract costs the cost of a considerable part of the funds that were held, and that is true for 1929 and 1930.

The amounts that I have set down here as held for the associate companies appear in column 3. Those amounts are

the difference between the amounts appearing in the first section of column 2 and the amounts appearing in column 1. Column 2 is deducted from column 1.

2717 In making the allocation to the Long Lines here, I used a new composite, a composite of ratio of estimated requirements, plant investment and gross additions. Those factors, in my judgment, represent the best measure of the demands of the Company for money, estimated requirements being the picture that the Company has ahead for the year, the plant investment representing the size of its property, and the gross additions the gross volume of construction activity.

Now, the use of that percentage allocates a considerably larger portion to the Long Lines than other composite percentages which I have used in connection with other exhibits. Having allocated the amounts to the Long Lines and deducted that, I get the balance that should be allocated to the associate companies. That is shown in column 3.

My allocation to the Chicago area is also made on the basis of estimated requirements, plant investment and gross
2718 additions. There the percentages reflect the estimated requirements for the Chicago area.

In my opinion, the figure shown in the extreme right hand column on this sheet represents the minimum amount that should fairly be allocated to the Chicago area as its part of the funds held available by the American Telephone and Telegraph Company for the associate companies during the years in question; the amount of the funds actually held available for the Chicago area.

The second sheet is an allocation to the Chicago area of the estimated costs incurred by the American Company of holding funds available for the years 1923 to 1931, inclusive, and the figures in the first column are the total costs of all funds held available by the American Company.

The ratio appearing in column 2 is the same ratio which appears in the exhibit immediately preceding. It is
2719 the ratio of the amount of funds which I have set aside for the non license activities of the American Company.

in relation to the total funds held available, and I have carried that ratio over into column 2 as the basis for allocating costs.

Column 3 shows the amounts remaining after deducting the amounts in column 2 from column 1. That purports to show the amount to be allocated to the associate companies and the Long Lines. In column 4, I proceed to take out the Long Lines portions. I take it out by using the same ratio that I used in allocating the funds held available, that is, the composite ratio of estimated requirements, plant investment and gross additions. It is the identical figure. Having done that, that leaves me with the amount to be allocated to all the associate companies. This is in column 5. Then I allocate the part of that which, in my opinion, should go to
2720 the Chicago area. I do that in column 6. My ratio there is the composite ratio of estimated requirements, plant investment and gross additions. Those are precisely the same figures that appear on the other sheet of this exhibit.

In my opinion, the figures which appear in the last column to the right of this sheet show a minimum amount to represent the fair share of the Chicago area of the Illinois Bell Telephone Company of the cost to the American Company of holding funds available for the use of the associate companies.

"Mr. Blackman: I offer the two sheets, Plaintiff's Exhibit A 169 for identification, in evidence.

2721 "Mr. Goldstein: So that the record will be clear, in our calculations on license contract, there is to be no allocation to the Chicago area for losses on loans?

2722 "Mr. Blackman: We will make, as we now propose, no specific allocation to the Chicago area. We are including that item in our general expenses, general costs.

"Mr. Goldstein: Is there to be some more evidence on the license contract, to show some more allocation of costs, or are you completed?

"Mr. Blackman: We have completed. We are going to give you a summary figure, which will include a general figure for that."

Cross-Examination by Mr. Goldstein.

The telephone instruments were sold to the Illinois Bell on December 31, 1927. They were also sold to the other licensees on that date. I have not available for production this morning the bill of sale of the telephone instru-
2723 ments to the Illinois Bell. It is available. I am familiar with the contents of it, generally, or the basis upon which the sales were made.

"Mr. Goldstein: Will you please state the basis upon which the selling price was established?

"Mr. Blackman: Of course, this is not cross-examination. The witness has not been asked anything about that. I merely wish to call the attention of court and counsel to it.

"Mr. Goldstein: I will connect it up.

"Judge Wilkerson: We will allow pretty liberal cross-examination. If he has anything that is not relevant to the case, it is not considered. If what he has is revelant to the case, and you haven't gone into it on direct examination, if you call our attention to it, we will consider it as a part of his evidence, whatever that means."

I include in my exhibits an item for depreciation expense on telephone instruments. That depreciation expense was established on the straight-line method. There was a depreciation reserve that was built up as of December 31, 1927, on the books of the American Telephone and Telegraph Company.

May 19, 1932.

2726 My department, in the determination of the principle underlying depreciation, and in giving advice to the
2727 associate companies in connection with that subject matter, works in conjunction with the Operation and Engineering Department. I co-operated with the other departments in representing the Illinois Bell Telephone Company and the American Telephone and Telegraph Company in connection with depreciation matters before the Interstate Commerce Commission.

Our Company expressed its views on behalf of the Illinois Bell Telephone Company and the American Telephone and Telegraph Company for purposes of depreciation, and the factors to be taken into account, and so forth.

Our position was presented in a public hearing, at which we had witnesses present—Mr. Crunden; and the pres-
2728 entation was in charge of our Legal Department; but prior to that time, I think it was back in 1921, I did prepare and send a letter to the Interstate Commerce Commission. That was the very first chapter in the depreciation hearing. I am thoroughly familiar with the accounting phase of the principles underlying the depreciation expense; I assume I have gathered some knowledge over the years.

In determining the depreciation expense on telephone instruments, while the title was held by the American Telephone and Telegraph Company, my procedure was to ask our Operation and Engineering Department for their recommendations as to service life and salvage, and their views as to what would be a proper rate.

I had to do with the determination of the rate of depreciation on telephone instruments to the extent that I discussed the rate with the engineers, because I wanted to be satisfied when a charge was made in my accounts, that it was a proper charge.

2729 The only factors that I know are taken into account in determining the depreciation expense on the telephone instruments are service life and salvage, which we have taken into consideration.

I depended on the engineers to give me the factors of the service life. I imagine the factors of service life would be the period in which the instruments are in service; one factor is the time that the instruments are in service.

There are many factors that determine the life of a telephone instrument. A receiver and transmitter might be put into a telephone, and in a few weeks' time it might, for
2730 no reason at all that was apparent at the time it was introduced, be shown to be defective. That instrument would simply be bad, and it would have to be taken out. I do

not think obsolescence enters into it as a factor. Inadequacy would not enter into it materially as a factor. It might; as the telephone art progresses, as better transmitters and receivers come along, we endeavor to keep the service at a high standard. Supersession by a new type of telephone instrument might enter into it in a measure, because, as I just stated, as the art develops, parts of the instrument might be changed to improve the service. I do not think you can measure exactly in percentage how any one of those factors enter into the picture. The whole story is: the instrument goes in, and it goes out, and that is largely influenced by the judg-
2731 ment of the management as to what is necessary to keep the standard of service in excellent condition—a very high standard of telephone service.

As to whether the same factors enter into the determination of the depreciation rate on telephone instruments, as would enter into the determination, say, of station apparatus, I am not an engineer; I am just an accountant, but I would say that each type of property would have to be considered by itself. That is, the situation as to the receivers and transmitters is one which, as I have said, is influenced by our endeavor to maintain a very high standard of telephone service. It is influenced by the research work that Dr. Jewett so thoroughly described, and all of those factors enter into the life.

Now, so far as the telephone stand is concerned, that is a piece of mechanism which might be influenced entirely by other factors.

2732 As to whether the telephone instrument would ever be taken out of service because of inadequacy, or obsolescence, or because of a change in the art; take the inadequacy first. I presume if our people found that the instrument was not adequate to give a high type of service, and they had found something better, the instrument would be taken out for inadequacy, because it was inadequate to provide the
2733 standard of service that we sought to give.

It would sometimes be replaced because a new type of receiver or transmitter came into service. We would not withhold from the public a better type of telephone service, if

there were a better type available, or if there were better facilities available than we had in place, and we had those facilities developed.

Service life and salvage were facts that were developed in our Engineering Department, and I do not know what the exact salvage or the exact service life was. I only know the rate which came out of the considerations. The rate as I have
it was 7 per cent, and in earlier years it was 10, and then
2734 it was reduced to 8, and in 1923 it was reduced to 7.

Exhibit A-163 was prepared within the last week. Ex-
2735 hibit A-166 (this particular exhibit) was also put in this form within the last week, but similar data had been prepared for other cases during the last year. As far as I know, Exhibit A-163 was not delivered to the defendants until yesterday in the court room.

Copy of the bill of sale of telephone instruments to the Illinois Bell on December 31, 1927, is produced.

(The document was thereupon marked Defendants' Exhibit D-98 for identification.)

2736 Exhibit D-98 shows the total amount of the selling price of the telephone instruments to the Illinois Bell for the whole Company. That was $3,497,535.26.

Defendants' Exhibit D-99 for identification, being a sheet prepared by me, shows the basis upon which I arrived at the selling price. Of course, that caption states that this was the average for nine months, the period ending September 30, 1927.

(The document was thereupon marked Defendants'
2737 Exhibit D-99 for identification.)

I think the sheet marked Defendants' Exhibit D-100 for identification, entitled "American Telephone and Telegraph Company, Analysis of Reserve for Depreciation of Telephone Instruments, years 1923 to 1927," looks like my handiwork.

(The document was thereupon marked Defendants' Exhibit D-100 for identification.)

Defendants' Exhibit D-100 shows that on December 31, 1927, prior to the sale of the telephone instruments, there

was a depreciation reserve against telephone instruments of $23,345,905. On that date, there were also on the books of the American Telephone and Telegraph Company instruments used by the Long Lines Department, and instruments used by the licensee companies. But there were very few
2738 with the Long Lines. There were about 17,000 with a book value of $35,893, and the book value of the telephone instruments to the licensee was approximately $46,583,000. That would make the reserve somewhere around 49 per cent.

On December 31, 1927, we sold the telephone instruments that were used by the Long Lines Department to the Long Lines Department, at book cost less the full depreciation reserve of 49 per cent. That was because the Long Lines was a part of the American Company, and it was a transfer of the instruments to ourselves. For the purpose of the
2739 license contract, we have in a measure always treated the Long Lines as if it were a separate company; that is, so far as the accounts are concerned. The Long Lines keeps its own subsidiary accounts, and we keep the subsidiaries separate from the general departments.

At the end of every month, and at the end of every year, these accounts are combined, of course, into one, and all of these inter-departmental financial transactions disappear. But, as an operating unit, we have treated the Long Lines substantially in the same way that we treat the associate companies.

We sold the telephone instruments to the associate companies on the basis of current cost less 20 per cent.

2742 The figure in the first column of Exhibit A-163 of $46,583,314 is, as stated at the top of that column, the book value with certain adjustments made in respect of instruments held by the Western Electric Company. Now, that is not the current cost; that is the book value before the sale, reduced by certain adjustments. That one adjustment was the instruments held by the Western Electric
2743 Company. That was $651,078. They were owned by

the American Company, but were in the Western Electric Company's storehouses.

Now then, there is another deduction here of $35,893, which was the book cost of the instruments held by the Long Lines.

Now, I have not summarized here the figures representing the current cost of all of the instruments we had, computed as of the date of sale, but if you take this $38,000,000 [illegible] and consider that as 80 per cent of the current cost, you
2744 can get your current cost. It would be approximately $47,730,000. That is, however, excluding the current cost of the instruments in the warehouses of the Western Electric Company, and the Long Lines instruments. That is the $600,000 item plus the $35,000. And if you want the current cost of the total instruments, you ought to add in the current cost of the other instruments.

It is approximately correct to state that we sold [illegible] licensees the telephone instruments, which had a book value before the sale on the books of the Company of $46,5[illegible]214, for $47,730,000 less 20 per cent, or $38,183,000, with those slight adjustments that I mentioned. The current cost
2745 before deducting depreciation was slightly in excess of the amount which we carried.

It is not true that all but a million of that 20 per cent cut from current cost, would represent depreciation. You overlook the important factor that, between the time that those instruments were bought, and the date of their sale, there was a very substantial change in the value of the dollar, and the purchasing power of the dollar. Now, of course, we have got to take that into consideration. The dollars that were on
2746 the books of the American Telephone and Telegraph Company represented the cost of those instruments over
2747 a period of years to December 31, 1927, and that was $46,500,000. There was at that time a depreciation reserve of $22,000,000 against it.

The sale was made on the basis of $47,000,000, or $1,000,000 over the book cost, less 20 per cent, which gave $38,000,000 in round figures. However, the $47,000,000 is not comparable, so far as value is concerned, with the $46,000,000 book cost.

The value of the dollar has changed in that period very substantially. Property values have increased. We determined the measure of the increase by taking the current Western Electric price for the nine months from January 1 to September 30, 1927. The current price of the Western Electric Company, of course, was the then current price, and reflected the then value of the dollar. But some of the instruments that were on our books at $16,000,000 had been bought some years before at lower prices.

If the Western Electric Company were asked to sell those instruments that were on the books of the American Telephone and Telegraph Company on December 31, 1927, assuming that they were brand new, the Western Electric Company would have charged $47,300,000. The purpose of cutting that 20 to 30 per cent was to arrive at a very reasonable sale price.

I said yesterday, I believe, that the record shows that the condition of those instruments was 92 per cent. Now, we took off 20 per cent to produce a sale price that was, in our judgment, very fair and reasonable to the companies. The 20 per cent is to take care of the condition of the instruments and considerably more, so that the price to the companies would be reasonable.

2731 We had a reserve on December 31, 1927, of approximately $23,000,000 against the book value of those instruments. And the purpose of the moneys accumulated in that reserve was to take care of the ultimate retirement of the instruments, due to factors that enter into depreciation, or to any ultimate disposition we might make of them. The factor of depreciation might be varied because of a change of December 31, 1927, in the title to the instruments.

It is true that the telephone instruments were used by the Illinois Bell the day before and the day after the title 2732 was transferred, but conditions change. I do not know that the conditions changed because of the transfer of the title, although that is simply my opinion.

2733 Speaking now about those things which were used by me in determining the depreciation expense prior to 1927, which resulted in the accumulation of a reserve of

$22,000,000, the mere bill of sale of those same instruments from the American Telephone and Telegraph Company to the Illinois Bell would not change the rate of depreciation expense, but there are other factors that might change it very substantially.

Immediately after the sale, it proved that the amount that we had accumulated was more than was necessary to take care of the depreciation; but the day before the sale, or a month before the sale, I would say that the amount we had in the depreciation reserve was absolutely essential to the protection of our investment. We knew that the reserve was too much the minute we had negotiated the sale, and knew what we were going to get for the instruments, and knew what was left in the reserve after we wrote off our book value.

If the Illinois Bell had those instruments under the same conditions that the American Company had them, I should say that it would be foolish if it did not have the same size reserve; but conditions change, and the conditions under which the Illinois Bell holds those instruments, and the changed condition since, may give you another picture.

According to Defendants' Exhibit 100, the depreciation reserve was more than we needed. There was $14,000,000 left. We transferred it to surplus, from which part of it came. That part of it that came from surplus, came in 1912, and was $5,629,447.

The situation was this, briefly: Prior to 1912, there were very few businesses in this country that carried depreciation accounting. They met the depreciation as it came along. In 1912 I think our business was one of the pioneers in setting up depreciation reserve. In 1912 we felt it wise to set up a depreciation reserve, and we reached into our surplus to take out $5,600,000 odd, and set it up distinctly as a reserve. We set it up as a foundation for a reserve for depreciation, which was then, I believe, .46 per cent of the book value of our instruments. Then we kept on for a number of years, and set aside 10 per cent, and then 8 per cent, and as we set aside 10 per cent, the reserve crept up to about 30 per

cent .54 per cent, I believe; and then, with the use of the 8 per cent, it came down a little bit; and then, with the use of the 7 per cent, the relationship dropped still lower, until I think in the last year or so, for some temporary condition, or in the last two or three years, because we were putting in a great many new receivers and transmitters, our reserve momentarily went back to about 49 per cent. Now, the factors are perfectly clear on our books.

2758 Telephonic instruments were furnished to the licensees for many years. We collected 4½ per cent under the license contract, the same as we did from 1912 up to 1926. But there is no relationship between the depreciation expense which we carry on the books of the American Company, and the license revenue which the associate companies pay, no relation whatever.

2759 We set up this depreciation expense because we knew that we had an expense of retirements to meet. We had depreciation accounting in one form or another in effect since 1909, and earlier than that. From 1909 to 1912, we charged into our expenses amounts to take care of retirements to come.

2760 As to whether there was a reserve account prior to 1913 on the books of the American Telephone and Telegraph Company for telephone instruments, I would have to refresh my memory, because I just came to the telephone business in 1913. I can and will check that. This $13,000,000 was left after we had written off the book value of the instruments. That did not represent a profit to the American
2761 Telephone and Telegraph Company. And that is because, in the first place, you cannot take $5,600,000 out of your surplus and then put it back and say that you have made a profit of $5,600,000.

Then, on the $9,000,000 balance there was no profit, this I do not consider to be a profit, because, prior to 1925, we simply charged to our expenses the rates of depreciation that we felt were proper, and we accumulated that amount of money in a reserve. We might have put into our operating

expenses 4 per cent or 5 per cent, and carried the rest to surplus as the years went on, and when we came to 1927, we would not have had any $8,000,000 difference. We had just as much one way as another. It was not charged against the licensee companies; the depreciation money was taken out of
our earnings from whatever source those earnings came.
2762 We thought it wise and prudent business management to carry a good reserve against those instruments.

Exhibit A 162 shows that the depreciation expense that we were charging against the license contract revenues from 1923 to 1927 was $13,200,000, if I have added those correctly.

"Mr. Goldstein: And the purpose for that is to show that out of the moneys you collected from the licensees, you would use up $13,000,000 to take care of depreciation expense for those five years, is that right?

"Judge Wilkerson: I suppose the lawyer knows more
2763 about it than the witness does. I think you had better put that question to Mr. Blackman.

"Mr. Blackman: I will be glad to answer, your Honor.

"Mr. Haight: Well, since Mr. Blackman says he will be glad to answer, let us have the answer.

"Judge Wilkerson: Yes. You want to know what the purpose of the exhibit is.

"Mr. Goldstein: Yes.

"Judge Wilkerson: I think counsel would be the proper one to state it. Counsel says you may state it, Mr. Blackman.

"Mr. Blackman: Well, sir, that merely is a computation
which we make here. As I say, and as I have said before
2764 to the Court, we charged nothing and have never charged anything against the license contract. We have charged 4 per cent as the rate which we required them to pay for the services rendered. Now, we do not try, and never have until this case tried to figure up the items that we would contrast against that. Now, we feel that we are in that position, and are doing it. With that end in view, we have set forth what we think are the reasonable charges to

set off against that, and among those charges is a reasonable depreciation on the instruments.

"We were carrying it on our books at 5 per cent for depreciation, so we set that up here in this exhibit as one of the things that this Court should consider in contrasting what we got with what we expended and suffered."

Witness continues: The items aggregating $13,000,000 are intended to represent real costs to the American Telephone and Telegraph Company in furnishing the telephonic instruments.

2765 They were amounts which were considered by our operation and Engineering Department, and by myself, as reasonable costs to take care of our investment in the instruments. We found on December 31, 1927, that there was $14,000,000 left in that accumulated fund that we were not going to use.

As to whether, if we had that money to take care of our cost and we were not going to use it, I would consider that a profit to the American Telephone and Telegraph Company, the answer is: I would not. Of course, as I have already said, the $5,000,000 was transferred out of surplus, and should not be considered as such. And the $9,000,000 was

2766 simply a return to our surplus of moneys that had previously been set up as 'depreciation,' that is, moneys set up for the purpose of taking care of losses that we are going to have at the time of retirement.

During the years when we set up those amounts they were considered as necessary and proper costs. But at the end of 1927, we found that we did not need the $9,000,000 exactly for the purpose for which we had provided it. We did not need it for any purpose in connection with telephone instruments, but it was a proper charge in the years in which it was made.

2767 I have stated that part of this $9,000,000 is due to the change in prices factors. Whatever it amounts to can be ascertained. Now, as regards the remaining $8,000,000, let us not overlook the fact, as I stated a few moments ago, that we charged 10 per cent depreciation for a good many years,

and we built this reserve up to 54 per cent, in the years prior to the time we are considering in this case, and we used 8 per cent. We used 8 per cent for the years prior to this case, and you certainly accumulate more in a reserve by using 10 per cent, and by using 8 per cent than you accumulate by using 7 per cent; and so, when we come to the year 1923, when we start the 7 per cent rate, the amount that we have in that reserve as a basic amount is there because of the 10 per cent rate, and the 8 per cent rate, and you cannot say that the $8,000,000 at the end of the period, or the $9,000,000, is due to an excessive amount of depreciation charges during the years 1923 to 1931, inclusive, because, if you will look at the reserve, you will find that during those periods it just about kept the same ratio to book investment as it had at the beginning of the reserve account.

If we had not charged a single dollar to depreciation expense for the years 1923 to 1927, we would have come out exactly whole at the time of the sale, so far as reserve is concerned, but that would have thrown the burden of the years 1923 to 1927 into a period away back before this case ever came into existence. That is the burden of the American Company in taking care of its instruments.

2769 In accounting, every year should take care of its own expenses. The function of accounting depreciation is to record the facts as we know them at the time we record them. Our depreciation expense is based upon our experience of the past, looking to the future. Looking at the future as of 1923, we were justified in setting up that depreciation expense. And we did. We did not take into account at that time the size of the depreciation reserve already existing.

We compute depreciation on the basis of the service life
2770 and salvage, as we see it. The reserve has nothing to do with it. The reserve simply reflects the results of your accounting, that is all.

When I set up the depreciation expense in the year 1927, I took into account, as I said, the advice given to me by the Operating and Engineering Department as to service life and salvage. I do not see why anyone, in determining that

depreciation expense, should take into account the depreciation reserve or the size of it.

I read the opinion of the Supreme Court in this case a long time ago, quite a while ago; I am not familiar with it. I think mention is made about the size of the reserve being an element in determining depreciation expense, but I do
2771 not know just what they did say.

Referring to Exhibit A-163: the 20 per cent was the deduction which the management, in its judgment, made as a fair deduction, so that the instruments would not be sold at other than a reasonable price to the companies.

Now, the 8 per cent that I have used here was taken from the testimony that had been put in in this case—I think it is in Plaintiff's Exhibit A-32, pages 8 and 9, where testimony was given by people who know the property, and who have intimately studied it, as to their judgment of what the actual depreciation in the property was.

The officers of the American Company and its Board of Directors, those who manage the property, determined the price at which the instruments should be sold. The matter of selling the instruments was discussed with the licen-
2772 sees, probably three or four years prior to the sale.

In 1927, on December 31, we sold those instruments at the current cost less 20 per cent. I don't know whether the President of the Illinois Bell was consulted specifically at that time or prior thereto as to the price which the Illinois Bell should pay for those instruments, but I know, as I have said, that for three or four years prior, the matter of sale of the instruments was discussed pro and con by the officers. I do not know what was discussed by Mr. Gifford with the presidents of the companies. I know the sale was discussed; I was so advised by the officers, and I was in conferences where it was discussed pro and con.

2774 The certified copy of a letter to the Chief of the Depreciation Section of the Interstate Commerce Commission, which is dated March 24, 1921, and which is identified by Mr. Goldstein as Defendants' Exhibit D-101, is a copy of a letter sent by me and referred to by me this morning.

When the instruments were sold to the Illinois Bell, I presume they were taken up on the books of the Illinois Bell, according to the accounting instructions, at the price paid. That is my impression; that is what would naturally be done.

As to whether the President or any official of the Illinois Bell was consulted at the time of the sale as to the price to be paid for the telephone instruments, I have no definite knowledge that any specific request was made upon any
2775 man, or any specific discussion was carried on with any president as to the price. I assume that such discussion did take place. I don't know who set the price, but I know it was approved by our Board of Directors.

I took the price for the billing from the official action of the Company. The entire price was determined at one time.

As to what was the reason for selling them on that
2776 day, it was considered a wise and proper thing to do.

Prior to December 31, 1927, the associate companies did not purchase telephone instruments from the Western Electric, as the license contract of the American Company provided that instruments would be furnished under the license contract arrangement.

Concerning the reason why the arrangement was made that the telephone instruments should be rented from the American Telephone and Telegraph Company prior to 1927, in-
2777 stead of purchased direct, that arrangement was in existence a great many years. The American Company, as the parent organization of the Bell System, was interested in developing a very high class of telephone service throughout the country, and saw the need of a fine service, and the benefit of a good telephone service. Now, it felt that by owning these instruments, and by establishing an arrangement with the companies whereby they could get these instruments and return them promptly to the American Telephone and Telegraph Company without cost as soon as the instruments became in any way defective, or did not contribute to this fine standard of service, there would be an inducement to the license company to work for the maintenance of a high standard of telephone service.

Now, on the other hand, the situation might have been that, if the license companies had bought these instruments and owned them outright, they would have kept them in the plant just as long as they possibly could, to save expense, to the detriment of a fine telephone service. But, by making the arrangement of having the companies in a position to pass these instruments back to the American Company and the Western Electric Company, and getting a new instru-
2778 ment as soon as one became defective, or as soon as a better instrument should be put into the plant, we were able to assist in the elevation of the type of telephone service.

Now, this matter of selling the instruments was discussed for some years before, but men like Dr. Jewett, who were interested in the high standards of service, advised strongly against the sale of the instruments. When 1927 came along, we felt that we had established a sufficiently high service consciousness, or exchange service standard, throughout the entire United States, in our local companies so that we could afford to sell the instruments because that pride of the companies in maintaining this high type of service would be such that they would take these instruments out and buy new ones as quickly as it was necessary to do it. Now, then, there was another factor that should not be overlooked. We were passing through a period of great scientific investigation and great research in the art of electrical communication and changes were possible and occurred, and it was felt by the American Company that it would be better to hold onto the ownership and control of these receivers and transmitters (which
2779 are really the heart of the instrument) so that they could develop them and keep pace with progress, and provide them to the companies whenever something came along that improved the service.

The cradle telephone first came into existence in our business about the latter part of 1926, I think. It had been approved for use by the licensees in 1927. It was not standard. There has been a real increase in the use of the cradle set throughout the Bell System.

2780 In determining what the current cost was in 1927, I did not personally consult the records, but the Western Electric price lists are in the possession of my department, and were used during 1927 in checking the Western's bills that were rendered to us. We had those price lists likewise from 1923 to 1927, in checking the bills for instruments.

2781 With respect to the sheets Mr. Goldstein identifies as Defendants' Exhibits D-102 and D-103, and states are price lists sent to defendants, Exhibit D-102 being entitled "Prices of transmitters, receivers and induction coils sold to both Bell and non-Bell customers from January 1, 1916, to December 31, 1925," and consisting of three pages; and Exhibit D-103, "Prices of transmitters, receivers and induction coils sold to Bell and non-Bell customers from January 1, 1926, to December 31, 1930": the first sheet appears to be a tabulation prepared by someone else than my people; and this second document is apparently a price list prepared by the Western Electric. I have undoubtedly seen these price lists prepared by the Western Electric, but I have not committed to memory the prices on the list. I have seen price lists

2782 such as mentioned here, as the second document, but to the best of my knowledge, I have never seen the first sheet.

I was generally familiar with the volume of the sales of telephones, receivers, transmitters and induction coils by the Western Electric to the American Telephone and Telegraph Company over the period of years. I did not commit the sales to memory. They are on my records.

Defendants' Exhibit D-104, which Mr. Goldstein states is a statement sent to defendants representing the sales of telephone receivers, transmitters and induction coils from 1916 to 1930, inclusive, appears to be a statement prepared by the Western Electric Company, and I had not seen that before.

2783 I did not consult with Mr. Cox as to the reasonableness of the prices of the telephone instruments sold to the licensee company. I never saw any studies of the profits to the Western Electric on the sale to the American Telephone

and Telegraph Company of the telephone instruments. We reduced the license payment from 4½ per cent to 4 per cent on December 31, 1925. Up to 1926, the taxes on the telephone instruments in the Chicago area were paid by the American Telephone and Telegraph Company.

2784 The American Company continued to pay some taxes on the instruments of the Illinois Bell through 1926, and small amounts in 1927; but considerably reduced amounts below those paid in 1923, 1924 and 1925.

Referring to Exhibit A-161, in 1925 the American Telephone and Telegraph Company paid $61,824 for the taxes on the telephone instruments. In 1926, the American Telephone and Telegraph Company paid $1,540 for taxes on the telephone instruments in the Chicago area. The amount that the Illinois Bell paid is $2,187 and 20 per cent of that was passed. And that $2,100 compares with the $87,000 in 1926.

Now, the situation is this: without being too definite,
2785 I have a recollection that, at the time the license contract rate was reduced to 4 per cent in the case of all the companies, we also took up with the Illinois Bell Company the matter of their assuming the taxes. But the taxes were a very small percentage of the reduction comprised in the one-half per cent.

It is correct that there were three companies which, under their license contract, had the American Telephone and Telegraph Company pay the property taxes on telephone instruments up to 1926 (one was the Chicago Telephone Company, another was the Pacific Telephone Company, another was the Cincinnati and Suburban) excepting as to such minor modifications as might have been made at the time of the reduction.

To the best of my knowledge and belief, it is correct that, prior to the reduction, up to December 31, 1925, the American Telephone and Telegraph Company was obligated to pay the personal property tax on the telephone instruments used in the Chicago area by the Illinois Bell Telephone Company.

After January 1, 1926, the Illinois Bell was obligated
2786 to pay this tax.

Now, we did pay some personal property taxes in

1926, and a few in 1927, which were holdovers from the previous period. But we did not pay those for the period beginning January 1, 1926.

The other licensees, prior to 1926, under their license contracts, assumed the obligation of paying the personal property taxes. They continued that obligation until after January 1, 1926. The reduction of one-half of one per cent in the license contract payment was made to all the licensees, including the Illinois Bell, on January 1, 1926. I am not familiar with the amount of personal property taxes paid by the Illinois Bell in 1926, except as stated on Exhibit A-169.

2787 I am not familiar with the amount paid by the Illinois Bell locally. I am making my statement on the basis of what they previously billed us, and I assumed they were correct in billing us all that should be billed to us.

Exhibit A-169 was prepared within the last two weeks. This particular exhibit was not furnished to the defendants yesterday, but they did receive similar data. I think last summer, at the time we sent them the data in the Ohio case, the same data, set up in a little different form.

2788 I should say we did furnish defendants the data in the second page, which shows the average total amount held available during the year by the American Telephone and Telegraph Company for general purposes, and for the Long Lines and the associate companies, and the basis of allocation. The amounts shown there as held available for general purposes were, I believe, on the exhibits we sent defendants. We never made the allocation to the Chicago area before because we had no occasion to do so. When we sent defendants the documents last July, we did not send them any allocation to the Chicago area.

Exhibit A-169 is different from the form in which we put the exhibits up in the Ohio case.

2790 Referring to Exhibit A-169, we held available $[illegible]000, as an average amount of total funds for the year 1924, of which I here allocated three million to the Chicago area. That money was held available, as far as the Chicago area is concerned, to meet the current money demands [illegible]

Chicago area, that is, money demands for any purpose for which the Illinois Bell would require money.

Those demands would be made known to us in two ways. In the first place, the provisional estimate of the Illinois Bell filed at the end of 1923 would show that they required [illegible] a considerable amount of money, or that they would require certain sums of money, and then throughout the year we would receive advices stating more definitely when the money should be delivered to them.

The provisional estimate that I am referring to as of the end of 1923 appears to be the Statement F, "Provisional Financial Plan, 1923," identified as Defendants' Exhibit D-105. That was sent to us.

[illegible] The sheet which you have shown me here is the provisional estimate prepared in 1922 for the year 1923 and has nothing to do with the year 1924 at all. These requirements in Defendants' Exhibit D-105 are the requirements for the year 1923, and are $6,600,000, which corresponds to the figure shown in City's Exhibit 142-C (Rec. Vol. VI, p. [illegible]) as "estimated requirements" for the year 1923, $6,600,000.

Referring to the statement of the Company covering the financial plan for the year 1924, which is identified as Defendants' Exhibit D-106, according to this sheet, taking just a straight mathematical computation, it would be seven million odd dollars, $7,636,000, but this is not the final story as to the estimated requirements. These requirements may be modified from time to time. This would be the starting point.

The total requirements shown in City's Exhibit 142-C for 1924 are $10,080,000, according to my records in New York.

Mr. Goldstein: Now, accompanying this Exhibit F was a letter of transmittal, as accompanies every provisional estimate, which I will identify as Defendants' Exhibit D-107, dated November 14, 1923, addressed to Mr. W. S. Gifford, Executive Vice President, American Telephone and Telegraph Company, and is, I presume, signed by the President of the Illinois Bell, there is a place for his signature. Will

it be understood that that is the letter of transmittal which accompanied the estimate.

Mr. Braceler. Certainly, upon your statement, it that is legal evidence.

A copy of the letter of transmittal accompanying the provisional estimates goes to my department.

2784. I saw the statement in this letter (Exhibit D-107) which reads as follows: that the proposed program totals $19,000,000 for gross additions to plant, including approximately $[illegible] for additional plant for the Long Lines department in Chicago. The completion of this program during 1924 will require $[illegible] beyond our estimated current resources, but will not require any new financing. But that does not establish that this is the amount of the estimated requirements of the Illinois Bell for the year. This letter would establish a starting point.

Mr. Goldstein states that on December 20, 1923, there was sent a letter by Mr. Gifford to Mr. Abbott, President of the Illinois Bell, and on December 26, 1923, a letter from me to Mr. Garvey, the Vice President of the Illinois Bell, and hands me what he states are copies which are marked Exhibits [illegible] D-108 and D-109, respectively. They appear to be correct. According to those letters, there was owing on open account from American Telephone and Telegraph Company to the Illinois Bell $11,124,[illegible] on December 31, 1923. To the best of my knowledge, that is the correct amount.

The Illinois Bell put out a bond issue in the middle of 1923, [illegible] between ten and eleven million dollars to meet future financial needs of the Illinois Bell. Now, they did not require the money, so they loaned the money to the American Company during the summer and fall of 1923. We had agreed [illegible] with the Illinois Bell that we were to pay them the same [illegible] rate of interest on this ten million dollars as they were required to pay on the fifty million dollar bond issue that had been put out in June to retire the bonds which fell due in December, I think December 1, 1923. The Illinois Bell paid [illegible] on this new money; and we agreed to borrow it from the Illinois Bell at 5.5[illegible]. Now, we had it on our books as

an open account, it was a large amount, and at the end of the year we felt that it would be better for the Illinois Bell, and all concerned, if the Illinois Bell had that money invested in some form of Government security. We then transferred to them Government securities, but with a commitment to transfer those securities at a 6% rate, because we had previously agreed to borrow this money from them at that rate until they needed it in the business, and we wanted to live up to our commitment, so we gave them the Government securities, with the additional security afforded by the Government securities, and granted them the 6% rate. Now, the certificates that we sold to them in themselves were due on March 15, and we knew that they would be paid off at least by March 15, 1924, so, in order that we might make the best possible deal for the Illinois Bell Company in connection with those certificates prior to March 15, we put a clause [illegible] in the letter that we could at any time prior to March 15 repurchase them, and if we did repurchase them, we would then take the money back into the business again, at the 6% rate.

The American Telephone and Telegraph Company owed the Illinois Bell $11,124,000 on December 31, 1923, and as we [illegible] the Bank of England or anybody else, that amount is money. We owed them $11,000,000 in December, and we gave them the $11,000,000 Treasury Securities plus 6% [illegible]. The notes were returned, and we took the money back again on a 6% basis. When I say "account" I mean on an open account [illegible] loan.

During the year 1924 we liquidated the loan to the Illinois Bell, all but $2,000,000. We had to provide the funds to do it.

Referring to your memorandum dated [illegible] for the year 1924, it is not entirely correct to say that it calls for repayment by American Telephone and Telegraph Company of [illegible] moneys due to the Illinois Bell, as a method of financing their requirements of $6,600,000. Where it reads, "loan financing proposed for above", "net requirements", and "loans to American Telephone and Telegraph Company

repaid, $6,600,000", it means that the American Company would repay moneys to them that they had borrowed, just the same as if the Illinois Bell had resources from anybody to whom it had loaned money that would be repaid, as distinct from them being required to go and negotiate for new funds. That's all that means.

It is not correct to say that the estimated requirements of $6,600,000 that I speak of are the estimated requirements on the one hand that the Illinois Bell needs for its operations, and from the provisional estimate that same $6,600,000 would be estimated requirements that the American Telephone and Telegraph Company would require to repay its own funds.

The American Telephone and Telegraph Company had not borrowed the money from the Illinois Bell, just as it had not borrowed it from anybody, else, anywhere. And it paid the Illinois Bell a proper rate, and while the American Telephone and Telegraph Company had that money, it was American Company money just the same as when you go to a bank and borrow $5,000. At the same you feel that you have the right to spend it in any way that you please. The only obligation you have is to repay it when it becomes due.

The provisional estimate I simply said that the estimated requirements of the Illinois Bell Company for 1924 would be met by a repayment of a loan that they had made to the American Company. But, when the American Company comes to repay that loan, it had to reach in its pocket and find the money. When it got the money originally from the Illinois Bell it did not keep the dollars, it put those dollars in its treasury, it spent them in the business, and when the Illinois Bell wanted the money back, the American Company had to find it, so that the estimated requirements of the Illinois Bell are its gross requirements, and the financing service, which the American Company renders the Illinois Bell is the gross financial service which is rendered. That is the view which you must take of the picture.

In Exhibit A 169 the funds that the American Telephone and Telegraph Company held on hand in 1924 were to meet a requirement of the Illinois Bell. The requirement to pay back

something that is owing to the Illinois Bell is a bookkeeping matter.

The money which the American Company held available, the $77,500,000 in the year 1924, was American Company money. It didn't make any difference whether it borrowed the money from the Illinois Bell or the Bank of England, or anyone else, it was its money. The Illinois Bell had given up responsibility for it, as long as it was getting a good return. We allocated a part of that as being held against the ten million demand which the Illinois Bell would make, because it had a ten million estimated requirement. Whether that demand was met by paying them back a debt which we owed them, or whether it was met in some other way, in advancing the money and taking a new note, that I say, is a bookkeeping transaction which does not go to the merits of the problem here at all.

In Exhibit No. 1, I show as being part of the costs of the American Telephone and Telegraph Company in rendering this service of holding funds available, $111,000 for the year 1924, but I don't charge it against the license revenue [illegible] at all.

I simply say this: that, in the year 1923, in so far as the provisional part of the funds held available for the Chicago area are concerned, it cost the American Company $111,000 to carry those funds, and that $111,000 is the difference between what that money cost the American Company and what it realized on this money of the Illinois Bell, and all other supplies money that was in the possession of the American Telephone and Telegraph Company.

In 1923, the Illinois Bell's estimated requirements were $10,000,000. In November, the Illinois Bell sent us a statement showing its estimated requirements were $6,000,000.

The $7,000,000 stated in the provisional estimate was [illegible] only the preliminary advice as to what the Illinois Bell expected its estimated requirements to be. We passed to the Illinois Bell in 1924, in gross cash, about $11,770,000. We owed them on December 30, 1923, before we gave them the Liberty Bonds, $11,000,000. Then we sold them the Liberty

Bonds on that day, with an agreement to buy them back
2805 on March 15, and to establish an open loan again. If you ask me what we owed them on March 15, I would say $11,000,000. We had borrowed $11,000,000 again from them on March 15. But we might have borrowed that $11,000,000 anywhere. We paid them back during that year, $10,584,000. We did not pay them back in 1924 in excess of the amount that we owed them during that year. But we had borrowed the money from them, and when we had to pay it back, we had to reach into our pocket and find it.

We rendered a very good service in 1924 in satisfying the estimated requirements of the Illinois Bell under the [illegible] contract, for which we set up a charge of $111,000 shown in Exhibit A-169.

2806 That service was, the Illinois Bell had $11,000,000 in March. In fact, we go back to January, because we were paying them 5.53 per cent on their money. They had that money. They probably could have invested it at [illegible] per cent in that period of time. We took it off their hands and gave them 5.53, held them free of all responsibility in connection with it, all they had to do was to say, "On such and such a date, we want $1,000,000. On April 2, we want $1,000,000. On May 3, we want $500,000; on June 21, $1,500,000; on June 30, $700,000; on July 1, $1,000,000; on August 30, $500,000; on September 30, $500,000; on October 1, $1,000,000; on December 1, $2,000,000; on December 31, about $1,400,000."

Now, they were relieved of all responsibility of investing the money and of safeguarding it; they could get it when they wanted it, as contrasted with the picture of taking the responsibility themselves for it, and taking a lower rate of return on it.

2807 It was a fact that we carried the Illinois Bell Company's funds for them during all that time in 1924, and relieved them of all of the responsibility, and paid them 5.53. But that is just one year you have picked here. I want to make this clear. You have picked one year here, where the financial relations with the Illinois Bell are different in some respects from other years. But just confining ourselves to

1924, the Illinois Bell received a very distinct financial service from the American Company, in that we took all the responsibility for the $10,000,000, or $11,000,000, and paid them 5.53 on it, and gave them the opportunity to call it back when they wanted it; and I doubt whether the Illinois Bell 2808 could have gone anywhere, or anyone could go anywhere, and put money out on as favorable conditions as the conditions under which the Illinois Bell left this money with the American Company. It just isn't done in business. When the American Telephone and Telegraph Company lends money to the associate company, the American Telephone and Telegraph Company gets 5.88. The American Telephone and Telegraph Company might get 5.88 somewhere else besides from the associate company.

As to why, if the American Telephone and Telegraph Company could get 5.88 from other sources, the Illinois Bell could not get at least 5.53 for its $10,000,000 in 1924, the answer is that on the conditions under which the Illinois Bell wanted the money, it certainly could not get more than 4 per cent, and I don't have to prove that. You can go to any banker and ask whether he would take $11,000,000 off your hands, and pay you 5.53 for it, and have you call upon him at any hour, or any day, to pay it back.

I haven't the figures in mind as to how much it cost the Illinois Bell to get the 5.53, that is, how much the net return on that $10,000,000 to the Illinois Bell was. It can be 2809 calculated. I have never calculated it.

Picking out at random a year which is a different year than 1924, so as to illustrate the situation that is covered by Exhibit A-160, take the year 1926.

On March 10, the Illinois Bell called upon us for $1,500,000; on March 31, for $3,000,000; on June 1, for $500,000. On June 9, they had a small amount of cash available, about $250,000, and they used it to pay off some of the money they had borrowed. On June 30, they asked us for $1,000,000; July 1, $1,500,000; September 30, $1,000,000; October 1, $1,500,000. Then, on October 20, they had a little surplus cash, and they paid us off about $750,000 on the borowings up to that time.

On December 1, they borrowed $1,000,000, and on December 9, $300,000; December 18, $700,000. On December 23, they repaid us $700,000. On December 31, $1,500,000 was borrowed.

Now, the gross borowings from the American Tele-
2810 phone and Telegraph Company during the year 1926 in these small amounts, constituting eight different borrowings through the year, were $13,500,000. All those amounts they had the convenience of paying back to us through the years, and reducing their interest charge by the interest on $2,700,000. Now, in my estimated requirements, I show that their requirements were $13,500,000. What I am now stating are advances from the American Telephone and Telegraph Company to the Illinois Bell, in the year 1926.

The figures showing the transactions between the parties beginning with 1930 are rather voluminous. There is a different type of financial service entering into this year.

On January 2, we paid the Illinois Bell $9,925,825, as the second installment on stock. That is, we were paying the Illinois Bell what we, as a stockholder, owed them
2811 in connection with our subscription of stock. Instead of coming to us and borrowing money, they said: "Instead of giving you a note, we will give you a stock certificate". They made subscriptions available to all stockholders. It was an open subscription for stock to all stockholders, but we owned the very large bulk of the stock, and before they issued this stock, they had to assure themselves that the money would be forthcoming, and whether they could finance in this way or not. We didn't guarantee to buy the stock.

We do not agree to finance them under the contract. We agree to give them financial service, but the practical appli-
cation of the contract is that we will assist them in
2812 every way in getting money to develop their properties.

Now, the Illinois Bell had large needs for the development of its property in 1929 and 1930, and it had two choices. It could have come to us and borrowed money from us, on open account or on notes, and carried along the notes, and then issued us stock at some future time; or it could come along and say: "Instead of issuing notes here, we will issue

you stock on an installment basis". From the point of view of meeting their requirements, the problem is just exactly the same, whether in our arrangements with the Illinois Bell we decided to proceed on a note basis for the time being, or whether we decided to proceed on the stock issue basis.

There is a difference between our relationship to the Illinois Bell in purchasing stock from the Illinois Bell, and that which exists in the case of the stockholders of the American Telephone and Telegraph Company, who are told that the American Telephone and Telegraph Company will need money, and they are given the right to subscribe.

The difference is that we have a contract to render service,—to serve the Illinois Bell, and we have no contract in the other relationship. The contract that appears as Plaintiff's Exhibit 7 (Rec. Vol. IV., p. 1196), is an old license contract. It is the one that was in effect in 1923. There has been a modification, or rewrite of if since; I think in 1930. But this contract, shown me by Mr. Goldstein, was in effect up until 1930. And in saying that, I don't want to be understood to say that this is identically the provision in all the contracts, because I would like to check it. I think it is the same.

2813

"Mr. Goldstein: But this is the provision in the contract with the Illinois Bell which you say distinguishes your position as an investor in the stock from that of an ordinary investor, is that right?

"A. Well, it is this plus all of the contract. The general spirit of the contract is that we render service of all kinds, of every description to the Illinois Bell in helping it give telephone service."

2814

The section of the license contract referred to is:

"Advice and assistance in any financing required to be done by the Licensee in the extension, development or improvement of its telephone system within its said territory and in the general matter of its finances; aid in securing funds on fair terms, as and when needed for new construction and other expenditures, but not, at any time, to a greater extent than the then condition of the finances and the credit of the Licensor may permit; active assistance in the marketing of

the Licensee's securities; and such other necessary financial support and assistance in the premises as will tend to serve the best interests of both companies."

"Mr. Goldstein: Is there anything else in the license contract that existed during the period from 1923 to 1930 which contains any obligation of the American Telephone and Telegraph Company regarding the financing service to the Illinois Bell?"

I cannot point to any other particular provision there, except the general spirit of the contract, which contains any obligation of the American Telephone and Telegraph Company regarding the financing service to the Illinois Bell. But may I call attention to the fact that even that paragraph is very broad, and there are great limits of interpretation as to what constitutes advice and assistance in financing, and
2815 what constitutes the scope of the other provisions. That provision is broad enough to comprehend financial assistance of almost any type, if you desire to interpret it that way. The Illinois Bell would not have an enforceable right to force the American Telephone and Telegraph Company to finance it, because it says that we shall not go beyond our ability.

Turning to 1930 again, I started to state the nature of the transactions between the Illinois Bell and the American Telephone and Telegraph Company. There are quite a few of them. On January 2, we paid the second installment on stock of $9,925,825.

We paid them, and the money was at that time,
2816 because of the peculiar tax situation in Illinois, not needed by the Illinois Bell, and was turned back—$2,200,000 of that payment was used to repay the advances that we had previously made to the Illinois Bell, and the $7,725,825 was turned back or was left with the American Telephone and Telegraph Company at interest at 6 per cent, whereas, if the Illinois Bell had taken it, it would have received, I am sure, a very much lower rate of interest.

We subscribed and paid for stock on January 2 of $9,925,825, the dividend on which is 8 per cent. The Illinois

Bell has paid 8 per cent for some years, as far as I know.

The dividend would not start to accrue on that $8,000,000
2817 from the date of the payment. This was an installment.

I think this installment carried 8 per cent. We paid an installment of $9,000,000, and it started to draw 8 per cent dividends and then, out of that installment, $7,000,000 stayed with the American Telephone and Telegraph Company on a 6 per cent basis.

In connection with that, let me say this, that this nine million was a part of a forty million stock issue which the Illinois Bell had planned to put out before the depression came along. I will take the time to clear up this picture so it is fully understood. Take the time the first installment came along: the Illinois Bell had borrowed money from the American Company, nineteen million or twenty million dollars, and when the first installment was paid, the first installment just canceled the amount of the Illinois Bell debt to us.

Now, in laying these plans, it had been fully contem-
2818 plated that by the time the second installment came due, the Illinois Bell would again have borrowed from us considerable in excess of ten million dollars; but the depression came along, and when the second installment (which had been put out in a circular to all stockholders long before) came due, the Illinois Bell had no option but to accept the second installment, and it was paid, and we took it back from them at 6 per cent interest, which was a higher rate than the Illinois Bell could have obtained anywhere. And its contract with all of its stockholders was that it would pay 8 per cent on the installments.

That was its contract with every stockholder. We did not receive any preferred treatment there at all. We got 8 per cent on that seven million which was left with us. We paid them 6 per cent, and we took their money off their hands at 6 per cent, as against their being put in a position of investing it at about 2 or 3.

I have just read a statement from the President of the Illinois Bell to the President of the American Telephone and Telegraph Company, dated November 13, 1929, handed to me

by Mr. Goldstein, covering the financial
the year 1930.

2819 This corresponds to the situation
of the Illinois Bell saw it on Novembe
let us not overlook the fact that the Illinois B
was planned almost a year prior to this fin
issue stock at that time, and the terms
have been offered, were made long before
written.

Our service in 1930, in connection wi
stock in 1930, and in holding the mon
first, to have available for them nine millio
the installment; and, second, our servic
them with funds at a later date through
ing left this nine million with us.

This money was left with us from
ruary 14, and it was repaid to them
all in cash to them, on January 2,
large part of this money, between Febru

It is true that, while we held th
2820 ting 8 per cent in the form of divi
ment, and we were paying them
a net of 2 per cent, because the circular
before provided that every stockholder
cent on his installments, and we were
a service,—we had every right on earth
Bell on January 2, "Here is your
Take it, invest it as you see fit, and
all right, it is no concern of ours." B
service of taking it off their hands

The American Telephone and Tel
probably a billion of stock during the
1930. And when it sold that
2821 holders the right to subscribe
gave its stockholders the right
ments, it gave what it agreed to give
cular was issued; it gave them

earlier installments, it paid 8 per cent. In the later one we got the installments down, I think, to 6.

In 1930 we got the installments down to about 5 per cent. But keep in mind in that connection that we had over $[illegible] from those stock issues that we took in and held for these companies.

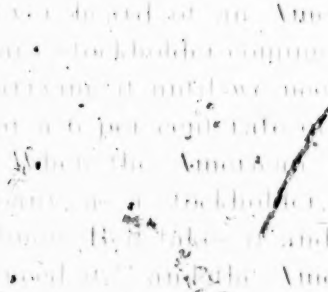
I never heard of an American Telephone and Telegraph Company stockholder coming to us and taking all our bonds and carrying it until we needed that money, if it's a per cent or a 6 per cent rate of interest.

28[illegible] When the American Telephone and Telegraph Company, as a stockholder, is ready to pay its money and the Illinois Bell takes it and says, "We will take it, but we don't need it," and the American Telephone and Telegraph Company retains the money, I think anyone would consider that that is a service which the American Telephone and Telegraph Company as a stockholder renders the Illinois Bell, and I believe it is. I do not consider it the same kind of service as when the stockholders of the American Telephone and Telegraph Company turn over installments to the American Telephone and Telegraph Company.

It could not be a service to the American Telephone and Telegraph Company to be able to hold that money until the Illinois Bell actually needs it, rather than to pay it at the time of the installment. It couldn't, under any possible way of looking at it, be a service because, if it is left with us, we would probably have to take 3 or 4 per cent on it, and we would lose money on it.

One of the factors in the value of that service that I mentioned is the difference between what the American Telephone and Telegraph Company paid the Illinois Bell on the [illegible] installment, and what the Illinois Bell could get if it put this money out. The other factor is the general overall convenience that enters into the picture there, having this easy working arrangement for the Illinois Bell.

If the Illinois Bell had put the money out on call in some of the banks lately, I imagine they couldn't get it back at any time.



In the year 1929-1930, they could not put the money out on [illegible] and get the same convenience that they got from the American Telephone and Telegraph Company. Call money could be called any time, but call money was only a brief [illegible] factor in the picture.

[illegible] If the Illinois Bell put the money with the American Company, it was sure to get it back, because the American Company would handle it in a most conservative way, [illegible] into Government bonds and into certificates, where they [illegible] be sure that all of this surplus money would be pro[illegible]. The Illinois Bell could buy those same bonds and certificates that the American Telephone and Telegraph Company [illegible] and it could suffer the same loss that the American Telephone and Telegraph Company suffered.

The loss I referred to is the difference between what the American Telephone and Telegraph Company paid the Illinois Bell and what the American Telephone and Telegraph Company got. That would not necessarily be the measure [illegible] in the value. I said that would be one factor. There [illegible] would be many other factors in this financial arrangement.

Another factor was the ease and promptness with which the Illinois Bell could get the money available without having [illegible] responsibility for it at all in Illinois. It just simply hands [illegible] to the American Company, gets a good rate of return [illegible], and when it needs it, calls up on the telephone or writes a letter and says: "Send us back $500,000 or $1,000,000."

Cross Examination (Continued) by Mr. Goldstein

May 20, 1932.

[illegible] I was present in the court room when Dr. Jewett testified. I recall the questions and the answers of Dr. Jewett in discussing the development and research expenses, and the allocations to the Chicago area. I recall [illegible] stating that he did not consider that any portion of the development and research expense is allocable to special commercial products, for the reason that he would not know

how to make such an allocation and because, to whatever extent the benefits of the research and development work of the American Company are found in the special commercial products, those values have been paid for in ways other than by an allocation of the credit for expense of development and research through the payment of royalties.

The American Telephone and Telegraph Company receives royalties on special commercial products. We have, I think, a statement showing the royalties received by the American Telephone and Telegraph Company. I will find it in just a minute.

2829 (A sheet which Mr. Goldstein stated was sent to defendants covering the royalties for the year 1931 was thereupon marked Defendants' Exhibit D 110 for identification.)

That statement, Exhibit D 110, looks as if it were prepared in my office. I presume it is correct, but I would like to check it.

2830 I now have before the sheet for the years 1923 to 1931, inclusive, showing the royalties received from the Western Electric Company and Electrical Research Products. That is not the sheet that I sent defendants last fall.

(Sheet produced by Mr. Heiss marked Defendants' Exhibit D 111 for identification.)

2831 This is a new sheet that I prepared. This sheet represents a statement of all royalties received by the American Telephone and Telegraph Company from every source.

Exhibit D 111 is a statement of the royalties received from the Western Electric Company, Incorporated, the Elec-
2832 trical Research Products, and others received by the American Telephone and Telegraph Company. I gave no credit in any of my allocations to the receipt of these royalties by the American Telephone and Telegraph Company. I do not know that there is a contract in existence governing those royalties which were received from the Electrical Research Products and paid to the American Telephone
2833 and Telegraph Company. There is an arrangement

existing between the companies, but I do not believe it is embodied in the form of a contract. It is probably just an internal advice, or letter form. There are probably a number of such letters that show the arrangements. I think the arrangements between the American Company and Electrical Research Products is that the Electrical Research Products Company is authorized to use a certain idea or patent for which the American Company will receive a stipulated royalty payment. Now that arrangement in some cases is through the Western Electric Company; in fact, I think that in most cases, I think in all cases the arrangement for the definite release of the use of the patents, and these ideas used in the non telephone field, is made with the Western Electric Company, because the Western Electric Company is the owner of the Electrical Research Products Company stock.

2835. Part of the legal expenses was the cost to the American Telephone and Telegraph Company of purchasing patents outside of the Bell System.

2836. When the American Telephone and Telegraph Company buys patents from outsiders, and the Western Electric Company gets the license to use them, the accounting practice is briefly this: if the American Telephone and Telegraph Company buys a patent on the outside, consideration is given as to the character of the patent. If it is something, if it is a patent that the American Telephone and Telegraph Company should own itself, and the Western Electric is licensed under the patent—that is, if it is a patent that goes to the Western Electric Company, or should go to the Western, something pertaining to apparatus or appliances, the Western is billed with the cost of acquiring that patent, and is given a license under it, and that license—or that

2837. license payment, rather, has been credited by me against our expenses, excepting in the case of a few small payments which were made in the years 1925, 1927, 1928, 1929 and 1930 that were shown on this statement, which we did not credit back against the license—our expenses, because of the difficulty of segrgating between accounts.

But ordinarily, it is our practice to credit back to the expenses of the American Company any amounts that the Western pays us for the patents. If the American Telephone and Telegraph Company paid $250,000 for a patent,
2838 from some source outside of the Bell System, and the Western Electric Company received a license to use that patent, the Western Electric Company would pay for the cost of acquiring for the cost incurred by the American Company in acquiring the patent. That would reimburse the American Company, and the amount would be credited against the account which included the original payment by the American Company and it would be taken out of my accounts.

2839 "Mr. Goldstein: We will identify as Defendants' Exhibit D-112, a copy of the option agreement which was sent to us by Mr. Bracelen, dated July 8, 1919, between the International Telephone Sales and Engineering Corporation, and the American Telephone and Telegraph Company.

(The document was thereupon marked Defendants' Exhibit D-112 for identification.)

I think I have seen the document before, but I have no recollection of anything ever arising in my accounting work which required my referring to that document. If at the expiration of this option one was given the Western Electric by the International Telephone Sales and Engineering Corporation, I had no knowledge of it.

2840 In 1927, the American Telephone and Telegraph Company received a dividend of approximately $48,000,000 from the Western Electric Company. I did not give credit anywhere in my computations to the license contract, of any portion of that dividend that was received by the American Telephone and Telegraph Company. There was no occasion to do so. There was no reason why I should do so.

I prepared the summary, Compilation of Costs Incurred in rendering license contract services, and amounts thereof allocated to the Chicago area, as shown in Exhibits A-103, A-108, A-117, A-124, A-152 to A-162, and A-164 to A-169, inclusive, which was handed to defendants yesterday.

"Mr. Goldstein: May I ask it that will be offered as
2841 a plaintiff's exhibit?

"Mr. Blackman: For Mr. Goldstein's benefit, we
2842 will offer it now."

(The document was thereupon received in evidence, marked Plaintiff's Exhibit A-170.)

2843 In Exhibit A 170 for the whole company I show, Cost of Temporary Financing, $1,535,913, in 1923, and no portion of it is allocated to Chicago.

I consider the service of temporary financing to be part of the services under the license contract so far as the American Telephone and Telegraph Company is concerned. I have endeavored here to present a statement of the costs of rendering license contract service, to the American Company, and under those costs, costs of temporary financing, are distinct costs.

I have in other cases considered the service of temporary financing and the cost of temporary financing in connection with our license contract services in an allocation to other licensee companies.

2844 I prepared City's Exhibit 142, and City's Exhibit 142-A. I show in City's Exhibit 142 that the loans which we made to the Illinois Bell in 1926, were approximately $6,000,000. Those were loans made to the Illinois Bell
2845 Company. The average stated on this sheet is a quarterly average, divided by four, and the amounts to which I testified yesterday were the detailed amounts from month to month.

I did not include the losses on these particular loans, as a part of the cost to the Chicago area because I personally did not feel they should be so allocated, and on advice of counsel, that matter was left out.

2846 According to City's Exhibit 142-A, the Indiana Bell Telephone Company 1923 license payment was $363,065.37.

We had average loans outstanding during 1923 of
2847 $16,427,375 to the Indiana Bell, but it was an accumulation of a number of years.

I did not compute the losses to the American Telephone and Telegraph Company by having outstanding the $16,427,000 of loans at 5.88, nor compute from that how much was left of the license payment of the Indiana Bell Company to pay for any other services. I did not relate the matter at all to the license payment, because the license payment is a payment made for a blanket of services, and the character of the services rendered under that arrangement differs from year to year. One year the company might take a large amount of Operation and Engineering assistance, and another year might take considerable accounting assistance, and another year it might be financial. There is no attempt to relate the particular cost of any particular activity to the revenue paid for the year. But I did figure my loss on the $16,000,000, because the money cost me more than 5.88, cost the American Company more than 5.88, and if it was out at 5.88 and cost us more, why, it is just a plain and simple proposition, that we incurred a loss on it.

"Q. If you incurred a loss on holding funds to make temporary loans and included that in the license contract, why did you not include as a charge against the license contract the losses that you make after you have the loans outstanding?

"A. Because the situation is entirely different."

2848 "The loss on holding funds available is the loss on money which we hold in New York subject to call, and the loss on temporary financing is the loss which we incur on money that has left the possession of the American Company, and has gone to the associate companies, and is probably invested in the property of the associate companies."

"Q. That is your theory, as I get it, is that losses are chargeable before the American Telephone and Telegraph turns over the money to the Indiana Bell, but after it turns it over, then the loss is not according to the license contract, is that it?

"A. Well, I just felt that I did not want to put it in here." In the interest of conservatism, I did not want to put it into the Chicago area, but I still maintain that it is a

2849 definite loss on the part of the American Company.

The license contract provisions with reference to advice and assistance in financing, are the same for all of the licensee companies.

I stated and still state that the service which justified setting up a charge against the licensee payment from the Chicago area for holding funds available, was that we were holding the funds so that the Illinois Bell could receive aid from us to meet its requirements, and give us either stock, or whatever security was agreed upon. That same sort of service was applicable to the other licensees as well.

When we turned over the money to the Illinois Bell,
2850 or to any licensee, it did not make any difference to us whether we received a note for it or had it on an open account, or received stock, just so that we have something to evidence the fact that we have passed money out. Of course, there is this, there is a real difference; when we loan money on notes, or on open account we are in a creditor position, as against the companies. When we take stock we enter into an investor's relationship, with all of the obligations or all of the contingencies I should rather say that go with stock;
but when we loan money, we take notes, or an open
2851 account, and that comes ahead of the stock. We are in a better position.

"Q. You own either 100 per cent of the stock or 99 per cent of the stock of practically all your licensee companies, is that correct?

"A. Oh, no! Oh, no!"

We have the same arrangement with the New England Companies where we own, not much more than 60 per cent, and in the Southern New England Company, where we own about 30 odd per cent, and in Cincinnati, where we own about 30 per cent, and with the Pacific Coast Company, not over an 80 per cent control; so that the same arrangement applies to all of the companies that have the license contract, whether we control them or not.

Looking at Section 212-A of the Annual Report of the American Telephone & Telegraph Company to the Interstate Commerce Commission, you will read in the first one

there, the New England Company—that is a licensee
2852 company, and that is 57.95 per cent owned. Take the Ohio Bell common, and you will see 100 per cent, and 59 preferred. Of the Mountain States Telephone & Telegraph Company we own 72.8 per cent.

2853 In 1923 we had 99 per cent ownership in the Indiana Bell, and we had $12,081,022 book value investment in stock in the Indiana Bell. We received no dividend on that investment for that year, and that was one of the contingencies that I referred to here a while ago. In that same year we had with the Indiana Bell, $16,427,000 in loans accumulated over a number of years.

We had in the Indiana Bell in 1923—this is shown on City's Exhibit 142-D that I sent defendants—in Indiana we had 7 per cent 3 years' time notes in 1923, paid in 1925. They were the notes that the Indiana Company issued at the time it bought the major part of its property, and that is
2854 included in the exhibit I sent defendants—7 per cent.

Now there may have been—I am not certain without referring to my records, but there may have been some 6 per cent money also, but I know that there was a considerable volume of 7 per cent money to the Indiana Bell in that period, and up to 1925. In the same year we had $23,498,945 investment on which we were receiving 1 per cent dividend from the Ohio Bell, that was all that it could afford to pay under the rates that it received. Now in that same year
2855 we had $9,530,000 of notes, of the Ohio Bell. That money was on a 6 per cent less 2 per cent, basis.

We charged as a part of the cost of license contract
2856 services the difference between what we received on moneys held available for the licensees, and our cost of the funds. The American Telephone & Telegraph Company loaned money to the Indiana Bell, for instance, and was paid 5.88 for that money. And the cost of the funds in that particular year we will say was 6.87.

2857 I charged up as a part of the cost of the license contract service the difference between the 5.88 and the 6.87, in figuring the costs of the American Company, the total

cost to the American Company, but none of it was allocated to the Chicago area. I have allocated it against the other licensees' payments in other cases. I did in other computations that I made; I included the cost of temporary financing, but as one grows older, one gives further consideration to things, and has the right to change his mind. I did that in Ohio in 1931 and I have changed my mind since as to
2858 the allocation. I did it in 1929 and 1930 in Michigan.

"Q. And when you did that you found there were no moneys left from the licensee payments to pay for any service, is that correct?

"A. I did not make that check at all.

"Q. You don't know whether, do you?

"A. I never took occasion to inform myself as to that fact. It would mean nothing to me if I did.

"Q. What caused you to change your mind, Mr. Heiss?

"A. What caused me to change my mind?

"Q. Yes, as to whether it is proper to put it in or not.

"A. It was in the interest of presenting the most conservative statement of allocation of cost to the Chicago area, that I could present. I can put it in if you want it put in, but I felt that in the interest of conservatism, I should not put it in."

I never made a comparison between the amounts available from license payments for the particular services for which we charged the Illinois Bell, in the case of the Illinois Bell and the other licensees.

2859 If you are referring to specific costs for any particular services, of course, I was curious enough in this case to see what cost we had allocated to the Illinois Bell, and what we had received from it, just as a matter of curiosity.

"Q. If you found that this loss on loans and loss on stock absorbed all the license payment, would you consider your allocations fair, in which you charged the Chicago area a portion of your costs when there was nothing left from the other company?

"A. Mr. Goldstein, it would not have entered into my

consideration at all. I would have stated the facts of cost as I found them and let the chips fall where they may.

"Q. All right.

"A. With regard to the comparison of revenue."

2860 Referring to Exhibit A-169, I use as a basis of allocation a combined or composite ratio of estimated requirements plus Plant Investment and Gross Additions. The sources of the estimated requirements were C. R. 13, which we furnished to your people for inspection and I think they were in defendants' possession for quite a long time. C. R. 13 is a compilation made by the American Telephone & Telegraph Company, by my department.

2861 "Mr. Goldstein: I will ask to have identified as Defendants' Exhibit D-113, C. R. 13 reports for each of the years 1923 to 1931, inclusive."

(The documents were thereupon marked Defendants' Exhibit 113-D, collectively, for identification.)

"Mr. Goldstein: We will also identify as Defendants' Exhibit D-114, the C. R. 13 reports for 1920 to 1922."

(The documents were thereupon marked Defendants' Exhibit D-114, collectively, for identification.)

2862 As to the sources of the information on C. R. 13—I might say first, C. R. 13 is nothing more than a tabulation which I make up each year for my internal purpose, to take the record of my performance under the authority given to me by the Board of Directors and the Executive Committee to make advances; and this is merely a record, now, of what I am authorized to advance, and what I advanced, and then the statement C. R. 13 varies from year to year, depending upon my point of view as to what I want to show throughout the years in question. C. R. 13 is not 2863 entirely uniform in its preparation. At the end I finally come to the point of net cash advanced. Now I think that explanation is necessary to show the character of the document.

The figures in C. R. 13 are based on the provisional estimates received from the various companies which we finance. The estimated requirements shown in C. R. 13 would be in

the first column. In the first column there generally is a compilation, a summary compilation of the provisional estimates received from each of the licensee companies.

2864 We receive provisional estimates from the companies, that show their requirements, and we check that figure, and then the amount of a company's requirements is first submitted to the Board of the Executive Committee for approval, and if the Board or the Executive Committee approves it, then I put the amount in the first column. Generally it is the same amount as appears in the provisional estimates. But, now, take this year 1923. The first column of C. R. 13 shows $139,928 as the total amounts which the Board or Executive Committee have authorized me to advance to the companies, but as the year went on there was given to me an additional $28,350,000 authority.

To determine whether the figures which I used as a basis for my allocation in Exhibit A-169—it would not be necessary to get the provisional estimates of each of the licensee companies in order to determine whether these figures in C. R. 13 are correct. One can work from C. R. 13 with very sub-
2865 stantial accuracy. That C. R. 13 computation represents the estimated requirements of the companies after they have gone through the scrutiny of the American Company, is correct. The starting point is the original estimates. But, C. R. 13 is a sufficient compilation of those, and that has been in defendants' possession.

Each licensee company sends a provisional estimate in the same form as we discussed yesterday, which is the starting point, in giving its estimated requirements, as they see
2866 them. We review them, but it is very seldom that we make any changes unless there are obviously miscellaneous items of financing and so forth that should be handled—that might be handled on some other and better basis. So that we might change the amount of the estimated requirements slightly, but generally it is the amount of the provisional estimate. My department and others in the company review it, and it finally terminates in an authorization by

2867 the executive committee. And those are the amounts that are stated in C. R. 13.

The next item which I use, as the basis for allocation, is Plant Investment. That was taken from C. R. 64-A for the associate companies, which as I understand was avail-
2868 able to defendants; and taken from Long Lines monthly report 6—Illinois Bell Telephone Company Monthly Report 6, and for the Chicago area monthly report 6. All of which I understand defendants have available.

The figures in C. R. 64-A are a tabulation of the monthly reports of the companies. They are the monthly reports that contain the corresponding data in C. R.—or monthly
2869 report 6 I think. I can say with sufficient accuracy that C. R. 64-A is taken from monthly reports No. 6 of the companies.

The gross additions were taken from the identical records that I used in getting Plant Investment, M. R. 6, and C. R. 64-A.

I used a composite figure of the Estimated Requirements, Plant Investment and Gross Additions, for the reason that they give three different pictures of the use to which money held available is sooner or later applied. For instance, the estimated requirements measure the picture, the general
2870 picture presented to us by the companies. Plant Investment gives you the size of the plant, and indirectly reflects something of the need of the money.

The Gross Additions in any year give you the gross construction activity going on in the company, which is another indication, general indication of the money requirements; so I felt that by compositing the three, I would bring into the percentage a rather broad range of information in measuring this factor of holding funds available.

The estimated requirements are for future construction and this money is for future additions. The Plant Investment is the result of the moneys that were gotten over a long period of years. I said that simply showed the size of the property.

2871 "Q. You have a definite determination of the estimated requirements, is that correct?

"A. The size of the home determines the size of the running expenses.

"Q. But you are using this money not for running expenses; you are using it for gross additions?

"A. Yes, and the size of the home would determine the amount you might spend putting additions to it, if you were a growing family.

"Q. But you are not speculating as to the amount required. You have their estimated requirements, you have them definitely determined, have you not?

"A. I have.

"Q. So having definitely determined how much they need, why did you include the plant investment, which represents accumulation of the past?"

I felt that a composite of the three in my judgment was a better picture than taking estimated requirements alone. The more factors that you bring into the picture, the better, or the more fair—the better and fairer judgment you
2872 can reach. That is the only reason for including Plant Investment.

I did not take into account the possible fact that the Illinois Bell had very small estimated requirements, and a large plant as compared to other companies that had small investments and large requirements. It never entered into my accounting, in making the allocation. And I would use the same allocation anywhere, in any other company.

The money that is held available by the American Telephone and Telegraph Company is generally for Additions to Plant. The materials for additions to plant come practically or entirely from the Western Electric Company purchases. Some of the installation comes from the Western Elec-
2873 tric. The labor element is quite large. A large part of the money which the licensee companies, including the Chicago Company, need, is for buying materials and installation.

The Western Electric Company is one of the creditors.

"Q. And so, as they draw it down—so that the Western Company knows in advance, doesn't it, each year, as to the purchasers of the Western Electric Company, that they will have the money available for the merchandise purchased, is that correct?"

Well, I suppose, based on past experience, the Western Electric can say that its bills have always been paid, and
2874 they will be paid in the future. The Western Electric Company, as anybody else might have, has the knowledge that the American Telephone and Telegraph Company is holding this money available for the licensees. The Western Electric does not have any more access to my books than anybody else. No officials of the American Telephone and Telegraph Company are on the Board of Directors of the Western Electric Company. There are not any common directors to my knowledge. There is no exchange of information between the two companies, in the sense of their giving us information, in exchange for what they get from us. After we get up the provisional estimate requirements at the end of any one year, we may advise the Western Electric Company as to what the possible needs of different types of plant
are for the companies for the following year, but that is
2875 simply so that the Western Electric can better serve the associated companies. Then of course the other way, from the Western Electric to us, there are certain limited reports that we get about what is going on in the Western Electric business, but beyond that there is no exchange of information.

The American Telephone and Telegraph Company owns 98 per cent of stock of the Western Electric Company. We furnished the Western Electric Company with data as to the physical units of property, but it would be of no interest to the Western Electric Company at all to know whether the Illinois Bell needed ten million dollars from us or twenty million dollars.

"Q. But would it be of interest to the Western Electric Company to know that the Illinois Bell needed ten million

dollars of purchases from the Western Electric Com-
2876 pany, and had arranged to secure the ten million dollars.

"A. No, sir."

In all of my experience as comptroller, the Western Electric Company has never asked me for, nor have I furnished to them, to my knowledge, the financial requirements of any company in the System for the year—the year ahead, or for the current year. What we give the Western Electric Company is information as to the physical units which they furnish. The money end is our concern; that is our relationship with the associated companies.

I imagine the Western Electric Company would know of the practice of the American Telephone and Telegraph Company to furnish the funds necessary for the Illinois Bell to purchase from the Western Electric Company. If they did not, I should say, that it would be rather strange, after years of association with us.

There is no occasion to reflect, in my calculations, the benefits, if any, to the Western Electric Company due to the fact that the American Telephone and Telegraph Company at the beginning of each year provides all of the money neces-
2877 sary for the customers of the Western Electric Company to pay their bills to the Western Electric Company during the year because anything that we do, that helps the Western Electric Company, to the extent of 95 per cent flows right back into the associated companies, as a benefit to them in lower prices, in a better building, a finer, better building of the local plants. Any benefits that may flow out from the Western Electric Company come right back again into the associated companies.

I am in charge of the accounting department. And as such, I know the accounting procedure in placing on the books of the associated companies, the purchases of plant.

2878 When the associated company, an associated company buys material from the Western Electric Company, it may either put it into Materials and Supplies Account, or directly into its Plant Account, depending on

whether it is immediately installed or not. Ultimately they come into plant account.

If the Western Electric Company benefits from any information which it gets from the American Company, whether we give it direct, or whether it picks it up indirectly, it goes to help the Western Electric Company do a more efficient job, and to the extent that the Western Electric Com-
2879 pany can do an efficient job, a more efficient job, it is reflected in the prices, in all of the prices; and in all of the relationships with the associated companies.

I have allocated against the Illinois Bell—the Chicago area proportion for holding those funds around $150,000 per
2880 year. The license payments which cover these charges are treated as an operating expense.

As to any saving to the Illinois Bell by having the Western Electric prices lower as a result of this relationship between the American Telephone and Telegraph Company, providing money and the Illinois Bell having the money available to pay the Western Electric Company, so that the Western Electric Company has no credit risk, I cannot in the first place pick out in any great minute detail, the benefits, the material benefits that the Western Electric gets. I know that there is a benefit there, and we assume it does go to the Western
2881 Electric Company. The benefit then goes back,—and much of that benefit goes right directly into the operating expenses, and even if it does go into capital account, in a very short period of time, all capital accounts find their way into the operating expenses, so that over a period of years every dollar of benefit that the Western Electric Company would get, or that would pass through the Western back to associated companies, comes right back home into the operating expense of the associated companies. It is just a question of time until it gets there.

Referring to the quotation from the license contract which says that the American Telephone and Telegraph Company is to give financial support and assistance as will tend to serve the best interests of both companies, I cannot appraise the

portion of the benefit which flows to the American Tele-
2882 phone and Telegraph Company. I do not know as I could appraise that at all. I do not know what the benefit—what benefits there would be. As I understand the situation, the thing we do is something that flows out, flows out to help the companies.

It is true that the American Telephone and Telegraph Company had an investment in the Illinois Bell in 1930 of $154,000,000. But I would not say that the American Telephone and Telegraph Company's investment in the stock of the Illinois Bell of $154,000,000 get any measurable benefit whatsoever because of this relationship, and the assistance which the American Telephone & Telegraph Company gives to the Illinois Bell.

2883 We own the stocks of the Illinois Bell as any other investor would, as any other investor would own any other stocks, and I have never yet heard of any owner of stocks being so generous as to take a part of what is a reasonable earning on his stock, and turning it back to the company to meet its expenses.

Now, we hold our stock, we hold this stock as an investment; we get the same dividend on it that any investor in Illinois Bell stock gets, and there can be no allocation of the license contract expenses to the American Company as I see it, except such as we have taken out in the 5 per cent.

I have never heard an interpretation placed upon nor have I interpreted the language "the best interests of both of the companies," in so far as the American Telephone and
2884 Telegraph Company is concerned, because as I look upon the license contract, it is one of the services to the associate companies. And in all of my experience as comptroller, I have never heard any interpretation put on that, that any consideration should be given to the thought that when we do this financing, we should also look out for our own interests, except such interests as any prudent investor, or any prudent banker—such care as he would give to his own interests, to see that his investment was a proper one, properly secured, properly safeguarded.

And in determining what would be a fair allocation
2885 to the Chicago area, I did give some thought as to what would be fair under the express provisions of that contract. And in connection with that, I did also take into account the express provision which says that the financing should be for the best interests of both companies. I gave it such weight as I thought should be given to it. I did not use any yardstick, such as the investment that the American Telephone and Telegraph Company had in the Illinois Bell, as a measure of the benefit because I did not feel that the whole relationship justified anything of that type.

The primary activities of the American Telephone and
2886 Telegraph Company taken as a whole are three. One is the operation of its Long Lines. That has been taken out in my allocation. The Long Lines expenses, and assets and everything have been excluded. The second activity is the license contract—is to render service to the com-
2887 panies under the license contract arrangement. And the third activity is simply the miscellaneous—minor miscellaneous activities that we may carry on, which is reflected by the very first diagram I think that Mr. Blackman introduced in the case. That is also reflected by the elimination which I have made in this case. That is my picture of the American Telephone and Telegraph Company.

"Judge Wilkerson: Is it a fair statement of the situation to say that it is a holding company with some activities of its own?

"A. In one sense you might say that the American Telephone and Telegraph Company is a holding company, but your Honor, I would say that the American Company is not in the usual sense a holding company."

It differs from the companies that are ordinarily spoken of as holding companies in this respect, that a company organ-
ized to be purely a holding company, buys and sells
2888 securities with the idea of making a profit on those securities, that is, finally getting something more out than was put in. Now, the American Company has never bought securities of its associated companies from that

point of view. If you go back to the very beginning of the license contract arrangement, the financial assistance to the companies grew up along with the research work.

"Judge Wilkerson: I just wanted to find out whether this was a peculiar kind of company, which was called a holding company, or whether it was a company that had dominance over a large number of subsidiary corporations, but carried on some activities in its own name and on its own account.

"Mr. Blackman: In a very broad sense of course it is a holding company. It holds the stocks of these companies.

2889 "Judge Wilkerson: I am not using it in any limited sense, as meaning that it speculated in the stocks, buying and selling. It buys for the purpose of controlling operations, or in relation to the operations of other property, but instead of actually taking title to the property, it permits the title to remain in the underlying companies.

"Now, as to the underlying companies it controls those through its stock ownership, and it carries on business of its own of course, in its own name, with its own corporate organization.

"Mr. Blackman: Yes, sir, that is all perfectly true, but what Mr. Heiss had in mind, I think, is quite an important distinction in this sense, that this company did not go out to acquire the stocks of these other companies, to become a holding company. What it did in the first instance was to own and control patents, and in the early days it licensed

2890 companies throughout the United States to operate under those patents. Then from time to time it took interests in those companies, usually minority interests. The companies that it was licensing got into financial difficulties and it loaned them money, and in that way its interest grew and grew until in most of the companies its interest has grown to a majority and in some a 100% interest.

In the case of the Canadian Company, it owns something like 26 per cent; and in the case of the Southern New England and the Cincinnati Companies it owns minority interests. In most of the companies its interest has grown to a majority.

"Judge Wilkerson: That is to say, instead of starting out

with a definite intention of doing this thing, by a process of evolution it grew into it.

2891 "The Witness: Through all of this period the American Company has never traded in the stocks of these companies. It has taken them in, and held them, and accumulated them, and it has held them, in my opinion, as the credit pool which furnishes the possibility of the American Company going out and getting the money that is needed to finance these companies."

2892 The total investment of the American Telephone and Telegraph Company in stocks of associate companies as of December 31, 1931 was $1,939,270,421.51.

The capital stock of the American Telephone and Telegraph Company increased from $719,000,000 at the end of 1923 to $1,841,000,000, in 1931. That is the average for the year. That will not agree of course with the December 31 figure.

2893 The dividends paid to the American Telephone and Telegraph Company on its investment in the licensee companies, in practically every case, at least since 1926, have not been on an 8 per cent dividend rate. Take the
2894 period 1923 to 1931, a number of the companies paid 8 per cent, but Mr. Goldstein called my attention to one that was only 1 per cent. The dividend rate of the Illinois Bell to the best of my knowledge it was 8 per cent during the period.

The investment of the American Telephone and Telegraph Company in the Illinois Bell at the end of 1923, that is the stocks owned in the Illinois Bell, was $74,335,134. That
2895 amount includes a few installments. Now, in addition to that, I do not think there was anything more than that, at the end of 1923. At the end of 1931 our investment, book value, was $154,212,653. That was an increase of about $70,000,000. That seventy odd million dollars was invested from 1923 to 1931 and there was a dividend rate paid of 8 per cent. The Illinois Bell earned its dividend each year according to my understanding.

2896 "Q. Now, your cost of funds from 1923 to 1931 was—in 1923 was 6.87; 1924, 6.85; 1925, 6.93; 1926, 6.83; 1927,

6.86; 1928, 6.55; 1929, 6.53; 1930, 6.25 and in 1931, 6.42, as shown on A-64; so that the cost of funds to the American Telephone and Telegraph Company was going down from 1923 to 1931. It put its money into the Illinois Bell and received 8 per cent on that money. Do you consider that as part of the activities of the A. T. & T. to make money on its investment in the Illinois Bell?

"A. I have said, Mr. Goldstein, that so far as the A. T. & T. Co. investment in the Illinois Bell is concerned, it is just the same—in stock, it is just the same as any other investment, and the American Company is entitled to its dividend."

It is entitled to its dividend the same as any other investor.

2897 It is entitled to its return, just as any other investor is entitled to his return, and the investment, the stock ownership feature, should be entirely segregated from this question of funds held available, and temporary financing. Now, in arriving at our cost of the money, the average cost of the money, that simply says what every dollar in the business of the American Company during those years cost us, and the dollars are not tagged. Every dollar cost us this amount of money, and if we held money available for the Illinois Bell, those dollars cost us on the average the same amount as any other dollar, and if there was temporary financing those dollars cost us the same amount of money as any other money.

One of the activities of the American Telephone and Telegraph Company which was considered by me was Long Lines. I have taken that out. The second activity which I have taken into account is license contract activity to serve the 2898 licensees. And the third activity which I have taken into account is whatever miscellaneous things we do.

The investor relationship of the American Telephone and Telegraph Company can be included in the third group, the miscellaneous, but divided into two parts. All we have to do as regards that third group is to see that our investment in stocks is so much, our dividends are so much, and those are the same dividends that anybody else receives. Now, the cost

of holding those stocks, and the cost of the custodianship of them, is a pleasure rather than a burden.

"Q. Well, now, having stated that there was the interest of the A. T. & T. as the investor, would you interpret that sub-section D as to financing, which says that it shall serve both interests of the company, to include the interest of the A. T. & T. as the investor?

2900 "A. I don't believe that should be considered in my license contract computations at all.

"Q. No, I didn't ask you that. I asked you whether, in the interpretation of that sub-section D of the license contract, which says that the financing shall be for the best interests of both companies, that you should take into account that the interest of the A. T. & T. is the interest of the A. T. & T. as an investor?

"A. So far as the interests of the A. T. & T. are concerned, the interests would be such as any prudent person would exercise in making an investment."

The American Telephone and Telegraph Company takes that into account in carrying out that sub-section D. It would be foolish if it didn't give some consideration, when it advanced money to the Illinois Bell, that there was going to be a return, because the American Company has the responsibility for upwards of seven hundred or eight hundred thousand investors in the business.

In my allocations I did not take anything out of the cost of service to take care of the interests of the American
2901 Telephone and Telegraph Company. From what I have said, there was no occasion to take it out, except the amounts of 5 per cent, and so on, that we take out in our deductions.

In arriving at the 5 per cent I did not take into account the amount of the investment in stocks of the American Telephone and Telegraph Company on the one side and the plant or whatever the investment of the Illinois Bell was.

I took into consideration the fact that there might be some little consideration given to the corporate activity that was

necessary, expenditure by the American Company in connection with the corporate meetings of the Illinois Bell and other companies in which it held stock, just the same
2902 kind of expense that I would incur if I were an investor in United States Steel, and wanted to see that my interests were safeguarded. I did not use the number of dollars of investment of the American Telephone and Telegraph Company as a yardstock in determining the 5 per cent separation.

I charged as part of the license contract costs the fees paid to the Directors of the American Telephone and Telegraph Company when they met, because they deal to the extent of 95 per cent of their activity with license contract activities.

"Judge Wilkerson: How much was that fee?

2903 "Mr. Goldstein: It is $24,000 in 1923, $29,000 in 1924; $33,000 in 1925; $32,000 in 1926; and $31,000 in 1927; $32,000 in 1928, $52,000 in 1929 and $49,000 in 1930."

"The Witness: You take into consideration there that there are twenty members of the Board, or nineteen. A number of those men are members of the Executive Committee,
2904 meet every week or two weeks.

"Mr. Goldstein: Pardon me, that is the same Executive Committee whose records you refused to show us, is that correct?

"A. Yes, sir."

Now that Executive Committee meets quite frequently, and the Directors meet at least once a month, and if a man takes responsibility for a concern as large as the American Company, I don't think there should be any question if he receives as much as twelve hundred dollars a year, or some average figure of that type.

I also charged against the license contract the annual reports of the American Telephone and Telegraph Company because the business of the American Telephone and Telegraph Company, after you take out the Long Lines, is almost entirely license contract. They didn't send out those reports, as incident to their acquiring or holding stocks. The people

throughout the United States, the Associates are interested in those reports.

2910 I have Exhibit A-155. Those are the expenses of the Comptroller's Department. One of the functions of the Comptroller's Department is to get up forms of reports for the licensee companies. That includes the forms of reports that are to be sent to the American Telephone and Telegraph Company by the licensee companies. Those forms of reports that are sent to each of the licensee companies have instructions accompanying them as to how they should be filled out. Part of our function is to advise the companies how to fill out these reports. Not all of the reports carry instructions, because it is self evident what they are. The reports are

2911 sent back to the American Telephone and Telegraph Company. When they are sent back, they are sent back in my department. My department studies them and distributes them to other departments that need them, and it combines them so as to get an over-all picture.

Included in those reports, the forms of which we have sent to the licensee companies, and which we get back in completed form, are, as I recall it, report M R 1, M R 1-A, M R 2, M R 3, M R 4, M R 5, M R 7, 21, 22-A, 22-C, 23 and analysis number 10.

The provisional estimates are also of the same character. That is, we prepare the form and send out the instructions and we get them back, and we study them, and we compile reports from them.

2912 The reports which my department compiles from these M R reports specifically mentioned, include C R-52, 53, 53-A, 54, 54-A, 67, 67-A, 67-B, 76, 86, 91 and 97. There are various forms of presentation.

"Q. And those are the M R reports and the C R reports, access to which has been refused to the defendants, is that correct?

"Mr. Blackman: Now, I think I can state that as well as the witness, perhaps a little better.

"Mr. Goldstein: All right. Let's state the facts.

"Mr. Blackman: Of course, the work which the witness

and his department do with regard to these reports and compiling, is relevant to this case, and if the defendants want to seriously question that work, why, of course, that may be an issue which they have the right to raise, and in order to permit them to raise that we have given them the forms of all of these reports. So far as these reports are concerned, the forms have all been submitted to them, and they are fully familiar with them. Now, the particular figures which have been written in for each of these companies have no bearing on the amount of work of the Comptroller's Department.

"Mr. Goldstein: Is it up to the Comptroller's depart-
2913 ment to compile those figures and put them in the report?

"Mr. Blackman: Of course it is.

"Mr. Goldstein: Is that of benefit to the licensee?

"Mr. Blackman: Why, yes.

"Mr. Goldstein: If it is, we have a right to see what they are.

"Mr. Blackman: That is where I differ with my learned friend.

"Mr. Goldstein: If the information on those reports is a part of the service rendered under the license contract, we have a right to see the nature of that work.

"Judge Wilkerson: Was that one of the matters taken up on the motions?

"Mr. Blackman: Yes, sir; and which this Court denied.

"Mr. Goldstein: Right. And we, therefore, will challenge the expenses of Exhibit A-155 to the extent that any work was done in connection with those reports, and that is the reason for the cross-examination.

"Mr. Blackman: My position, your Honor, is just this:
That they have those reports. They have the forms, not
2914 the figures. They have got the reports, they have every opportunity to develop any point in connection with the work of this department. Now, what those particular figures happen to be, whether the depreciation rate in one company

was 5 per cent, and another 7, makes no difference to the work of this Comptroller.

2915 "Mr. Goldstein: And as we have developed here, and as has already been developed, they have made use of plant and of revenues, and of expenses appearing on those reports, there isn't anything they have given us with reference to those excepting computations, which it would take us ten years to make.

"Judge Wilkerson: You must remember in a case like this, it is just possible to prevent relief by piling up an enormous record here which, in the end, is incomprehensible. Now, you ask to see these documents. If they permit you to inspect them, they are entitled to have them in. Or the Court is entitled to see them, if they are testified to. You cannot insist on seeing things without creating a situation where somebody is entitled to have it in the record.

"Mr. Goldstein: Right.

2916 "Judge Wilkerson: And when you come just simply to shovel carloads of material into the record in that way, the Court will scrutinize carefully whether or not it really helps the Court in arriving at a conclusion, or whether it is farfetched and fantastic.

"Mr. Goldstein: But it is our contention that they have used the very reports in every one of the allocations, and that the benefits of their services involve the comparisons which they are making on those reports. Now, if they don't want to give us access to them, they have no right to make use of them themselves.

"Mr. Blackman: That point, sir, is well taken, and we concede it, and we have offered them access, the papers have been here.

"Mr. Goldstein: You have not offered us access to the provisional estimates of the other licensee companies.

"Mr. Blackman: We have offered them access to every figure that we have ever used in any way in this case, we have said, 'We wish you to limit your scrutiny to the figures which have any bearing on these things,' these sheets and reports are very long ones, they contain figures dealing with fifty or

sixty different matters. Now, one particular line of
2917 that report is what we have used in many cases, that is, the plant investment of these various companies. It is shown on one line, in so far as we have used plant investment as a ratio, we concede freely their right to scrutinize the plant investment figures on this report, and we have offered, and we now offer, to let them see every plant investment figure. We have offered to let them see every figure on any report that in any way deals directly or indirectly with the figures that we have used in building up our ratios.

"We do say that we think it manifestly unfair for them to get these voluminous reports and scrutinize the whole report from beginning to end in the hope that they may find something somewhere in the report that they may use in some way, unrelated to the subject matter with which those reports were used by us.

"Now, in so far as we have used them, they are free to see them. Every line of those reports is open to them for their inspection, in so far as we have used it in any way. But
2918 there is no connection between revenues and plant investment, as reported on those reports.

"Mr. Goldstein: But you used the revenues and plant investment in your allocation, did you not?

2919 "Mr. Blackman: We will let you see everything; but I am directing my argument to one specific thing at a time. They say we have used plant investment. We say, 'Yes, and you are free to examine all figures that relate to plant investment on these reports.' But they say, 'We want to see what your revenues on these reports were.' We say no. When we come to revenues, and have used them, we say, 'Yes, you can see the revenues.' But we haven't used hundreds of other things that appear on those reports, and we say, as to those, we do not think you have any right to see them, and I understand that is the position which the Court has sustained.

"Judge Wilkerson: We have sustained that position. Of course, the mind of the Court is always open to additional argument, if you can convince us that you should have the right to inspect them.

"Mr. Bracelen: May I say this, your Honor, repeating what I did say upon the argument of the motion before your Honor and Judge Evans, if there is anything contained upon these reports that we have not used, but which is relevant, material in this case, they may have that.

2920 "Mr. Goldstein: And when will we get a chance to use it? That is the purpose of withholding it, so we can't use it, as a practical matter. If we have got to examine three thousand pages of documents when it is relevant, at the end of the case, as a practical matter it is impossible for us to make use of them, and we have asked for them for a year.

"Mr. Blackman: The figures on those reports do not make them relevant or irrelevant.

"Mr. Goldstein: We will develop it.

"Mr. Bracelen: It is now, I think, ten days since Mr. Goldstein was told that these reports were available for examination by him.

"Mr. Goldstein: I couldn't stop the case to examine those reports, could I?

"Mr. Bracelen: Of course, we can't help that.

"Judge Wilkerson: Well, Judge Evans and I both felt that there should be some limit to the question of production of this list of documents, and where the section of the Constitution is invoked by a company which is operating in one local community as to which the production is invoked, but is operating a large number of utilities in other sections, if it is a rule of evidence that the company put in evidence

2921 practically everything relating to the entire business all over the country, the net result is that a rule has been laid down which simply makes impossible a suit of this kind.

"Now, this practical question, if the decision of the Supreme Court in the end should say that that is the end of it, there is something vastly more at stake than the mere matter of rates in this case. That is, whether this form or organization can continue and be afforded the protection of the Constitution as to the particular limits in which it is operated. It may be that a rule of evidence will be laid down which makes it impossible for a company to get that kind of redress in a court,

but it would seem to us that the rule which is invoked here by the defendants in this case, carried out to its logical conclusion, would simply make a case of this kind impossible.

"Mr. Goldstein: Your Honor, it is our position that if the court's position is that you cannot use the comparative test within the system, then the company who comes into court cannot itself use that comparative test in this case.

"If it uses the comparison of revenues, expenses and plant of the Illinois Bell, compared to the others, then it has laid itself open, and we have a right to see all of the things
2922 bearing upon the revenue, whether or not they are proper.

"Judge Wilkerson: Now, let's stick to the particular thing we have here. We have expense of the comptroller's office. That expense of the comptroller's office is the labor of preparing and examining certain reports, and of analyzing them. They come in here and say that they expended so much work on that. They justify that by saying it is of benefit.

"Mr. Goldstein: Now, how do we know it is of benefit? If it was of benefit, we have a right to measure it, the relative benefit to the Illinois Bell.

"Judge Wilkerson: How can you tell whether it is of benefit by looking at the reports? How can the Court tell it by looking at the reports?

"Mr. Goldstein: They speak for themselves. The comparison of those reports goes to the licensees.

"Mr. Blackman: And precisely what those comparisons are have been in Mr. Goldstein's possession for months.
2923 "Mr. Goldstein: 86 has never been in our possession.

"Mr. Blackman: The only thing is, he wants to see what the precise comparison is. It does not affect the work of the comptroller whether the comparison shows up well for this company, or poorly for that company.

"Mr. Goldstein: No, but it does make a difference, when you use plant revenues and expenses, that we can see the character of the revenues that you have included, and the character of the plant that you have included.

"Mr. Blackman: He has all that, your Honor.

"Judge Wilkerson: Now, of course, coming down to this matter of a great regulating body in one state, we will assume such a body imposes a confiscatory rate on the utilities operating in that state. The threat which is held over the company is this: You may not have relief against the action of that state body unless you expose to the scrutiny of that body your business all over the country.

"Mr. Blackman: Precisely.

"Mr. Goldstein: No, your Honor, we say that is not so. The only time that becomes of importance is when they pool the expenses of all the companies, and then say, 'We are entitled to charge you one-twenty-fifth of the expenses,' and don't want to show us the character of the expenses of the other twenty-four-twenty-fifths.

2924 "Judge Wilkerson: Well, it might be that that item of the comptroller's would be of value; but let's go on."

These same reports are distributed to the people that are interested. The distribution is various. So far as I know they are used as a basis for the determination of the policy of the general staff and of the various departments of the American Telephone and Telegraph Company. I distribute them. I don't know what is done with them after they leave my office. I assume that they are used as sources of information, so as to give a better license contract service. I think there are one or two of these C. R. reports that go back to each of the companies.

2925 C. R. 86 goes back to the companies. C. R. 86 goes back to the Illinois Bell, and shows the unit expenses for each of the years for each of the companies, containing such information as current maintenance expenses per station, the traffic expenses per station, the commercial expenses per station and the miscellaneous expenses. That is related to plant and is related to stations.

C. R. 86 is sent to the Illinois Bell for the information of the president. It is a service we render to the president of the Illinois Bell under the license contract and not as an investor.

2926 I consider that the sending of this is of service to

each of the licensee companies, because he sees there the performance of other companies and he can gauge his own performance, in a measure, by it, and he has that much more information as to what is going on elsewhere in the telephone business. As to whether the experience of the companies are on a comparative basis, or on relatively the same basis, so that these relationships have value to each of the licensee companies, I know so far as they are based on
2927 the accounts that the same system of accounts as used in the classification of the various items of expense is the same. And as to what benefit it is to each of the companies to see these ratios of each of the companies for the same item, I should think any operating man would say, if he had comparisons of a number of companies, he could better gauge whether he was doing a good job or not. He might get a lot of things from the comparison.

There would have to be some degree of similarity to be of benefit.

C. R. 52, 53, 53A, 54, some of them involve compara-
2928 tive statistics of the various companies. Those comparative statistics are send around by my department to the various departments, portions of the general staff, for them to work on.

"Q. And the purpose of sending that to them is so that they can formulate a policy for all the licensee companies, is that correct?"

I said I didn't know what use they made of them. I send them around because I have been requested to send them, and I assume they want them because they want to educate themselves, to better serve the company.

The expenses under the license contract include the expenses of the employees of the various departments that make use of these C. R. reports.

2929 Referring to Exhibit A-164; what I have done is shown right on the exhibit. In the first column is the average amount of capital stock and premium installments and funded debt and so on. And in the second column I have shown the dividends paid and the interest paid, and the.

amortization charges. Take 1923, for instance, I show a cost of funds as 6.87 per cent. That may not be expressed as saying that for the year 1923 the cost of funds to the American Telephone and Telegraph Company was the cost of paying the interest and amortization on this funded debt, the interest on this capital stock installments, and the dividend of 8.79 on this capital stock, because that statement has omitted premiums and surplus.

The American Telephone and Telegraph Company did not pay 8.79 on its capital stock. When we talk about capital stock, you have got to add premiums and surplus in.
2930 It paid at the rate of $8.79 on whatever the capital stock was worth. We paid a $9 dividend.

The reason we have $8.79 is that we have a slight adjustment of moneys deposited with us by subscribers to the stock in connection with the new issues of stock.

Our cost of funds is really the amounts we pay out to take care of our interest and amortization on our funded debt, and our $9 dividend after making allowance for surplus and capital stock premiums. That cost we used in connection
2931 with all of my exhibits is the annual charges as representing the cost of the American Telephone and Telegraph Company under the license contract because that is what every dollar in the business cost.

Under Exhibit A-165 I showed another possible method of determining cost of funds, merely to make a showing of what the cost of money would have been if we hadn't given credit for surplus. I did not, in other cases, use a cost of funds on the same basis as I use it in A-164. I determined cost of funds in this case in the manner that I have in Exhibit A-164, because I think after long and mature consideration it is the right way, it is a fair and reasonable way to determine the average cost of all funds used in the business.

As to whether upon the supposition that the American Telephone and Telegraph Company, instead of paying a $9 dividend, would have paid at the rate of $15, I would have

considered the cost of funds to include that $15 also,
2932 ordinarily I would not have used the $15, but if it took a $15 dividend to get the money into the business, I would have used it.

If the company couldn't pay any dividend, I would not then have said it cost nothing to get this money because that would have been unreasonable. I draw the line at this point: If you will look at '23, you will notice that if you add to capital stock, capital stock premiums and surplus, that we were paying $7.17.

Now, stock money, of course, takes all the contingencies that go with it, and I did not consider in the first place that $7.17 was an unreasonable return on common stock money.

Mr. Gifford's statement of the Company's policy, that there would be no melons or extra dividends, but that it aims to pay dividends on stock sufficient to bring money into
2933 the business, the reasonable, fair dividend, and that we wanted to continue on that basis, is another factor to take into consideration.

Another factor to take into consideration is the tremendous volume of money that we have had to obtain for the business in the last few years, and I took this $9 dividend, which is $9 paid on say, roughly, $140 of equity, or around about 6.4 per cent on the dollar.

Now, I take that as a reasonable dividend. I certainly would not have taken a $15 or $20 dividend in this case, because that would have been unreasonable. I certainly would not have taken a 1 per cent dividend. But I took the dividend as a reasonable one,—what, in the opinion of our board of directors was a reasonable payment to make to get the money.

I have used another method within the last two or three years. In the Michigan case a few years ago, before I had quite as much experience as I have gotten this last two years in getting up license contract exhibits, I took the cost of funds in the immediate period. For instance, I took into con-
2934 sideration what we paid for money in the immediate year, and I took into consideration what we had paid during the last two years, or the last three years. For in-

stance, on temporary financing, I took a three-year period, what we had paid over a three-year period, and averaged that. On holding funds available, I took from a one to a two-year experience. But the absurdity of the thing was that if in one year we issued capital stock, and the next year we would issue bonds, why, this rate would bob up and down. In one year it might be 8.5 per cent and the next year it might be 5 per cent.

Now, where I was working with a period of nine years, why, it was obvious that it would be absurd to follow that basis. I testified in Michigan, in the case of Michigan Bell Telephone Company *vs.* Samuel Odell, on the 12th day of April, 1929. And in connection with my testimony, I offered an exhibit which purported to show a study of the license revenue and the expenses, as one of my exhibits.

2935 The exhibit identified as Defendants' Exhibit D-115 is an exhibit that I offered in the Michigan case on April 12, 1929. I have since filed in the same case an exhibit using the method of computing funds on the basis used 2936 in this case. I filed the amended exhibit in May, 1931, the first occasion I had to file a revised exhibit. That was subsequent to the Supreme Court opinion in the instant case. And in the second exhibit I used the cost of funds as used in our case and I also explained the differences.

2937 I explained that I felt that this method used in this case was a more reasonable, conservative method.

"Q. Now, Mr. Heiss, depending upon the method that you used would depend the margin that you have left from the license revenue after taking care of the charges, is that correct?

"A. Yes, that would follow."

If we used a method of determining the cost of funds, which cost was high, 8 per cent, it would leave us with a smaller margin than if we used one that involved a 6 per cent cost. Two items of license contract to which the cost of funds would be particularly important would be losses on loans, the temporary financing, and the holding of funds available.

"Q. And in those jurisdictions where the losses on loans

were high, as they were in Michigan, it would be of advantage to use a high cost of funds, is that correct?"

The volume of the loans in those jurisdictions never
2938 entered into my mind in selecting the method for computing the cost of funds.

Three years ago, before we had much experience, we were considering the method I used in the Michigan case. Since then we have changed to this method, and we would use this method in any jurisdiction.

For the year, 1928, for instance, my method used in this case, and my method used in the Michigan case would give some difference. What it would be, I haven't the figures in mind.

I furnished defendants with a copy of an exhibit which showed the revenues and the expenses in the year 1928
2939 as shown in the Ohio case, using the present basis of calculation. I have not a copy of that exhibit with me.

The exhibit that defendants were furnished on the present method is the exhibit entitled "Heiss Exhibit 10", which is identified as Defendants' Exhibit D-116.

Now, Defendants' Exhibit D-116, which I furnished in this case, and in which I used the present method, showed that the services cost the American Telephone and Telegraph Company an amount which leaves a net deficit for the year 1928 of $1,467,205.

In Michigan, for the same year, using the Michigan method for the same year, instead of showing a deficit of one million dollars, I show a deficit of seven million dollars, and the computations are entirely different computations.

2940 There are three different factors, all of which were explained to the Master in Michigan. In the year 1928, if you will look on the Ohio exhibit, you will find a deduction of, I think, two million.

2941 You will find a deduction of $2,000,000 that I made, an empirical deduction, to take out unlicensed expenses; I can explain that in a minute.

Now, that two million deduction was not in Michigan at all.

Now, another factor in Michigan was the difference in
2942 the cost of money. At the time, in 1928, when I hadn't much experience in this matter, I was told in conjunction with our people to set up the money costs in the way that I described. Now, that will make a difference of two or three million dollars.

We had a method which I used in 1928, and I saw fit to change that method, after mature consideration, for these present cases. Now, the third difference is that the taxes allocable to the Long Lines were put on a better basis, as a current accounting proposition, since 1927. Now, the three factors, the adjustment of the tax accounting of the Long Lines Department, the change in the method of computing costs of money, and the deduction of two million dollars, will make up any difference, any substantial difference that
2943 you have between my 1928 Michigan exhibit and my Ohio exhibit. Now, the whole effect of this has been to produce a lower license contract cost for these present cases, that is, the net effect is that we are coming here with a lower license contract cost.

2943 "Q. Does your cost shift with the case, or does it shift with the facts?

"A. Oh, no. If you had listened carefully to what I said, you must admit that a man has the right to change his opinion.

"Q. As to what they cost?

"A. Yes, honestly, if he studies it and comes to an honest determination, why, he has a right to shift his method to what he thinks is right, if he feels that his former method needs adjustment, why, he certainly is privileged, in a later case, to put in a method that, in his opinion, is a better method."

The method here is more favorable to the Chicago company, finitely more favorable. In the Michigan exhibit I
2944 showed losses on temporary financing as a cost of the service, of $4,100,000; and in the Ohio exhibit I showed there was a temporary financing cost of a million, making a difference of three million dollars in that item; and when I came to allocating to the Chicago area in 1928, I did not take

that item into account at all, although there were loans outstanding to the Illinois Bell.

I followed that procedure because I changed my method of computing the cost of money held available, and adopted for the former method, what, in my opinion, was a more conservative method, and after I had my total cost of funds held
2945 available for the American company as a whole, I decided that it was a conservative procedure not to allocate any part of it to Chicago and I would have done the same thing if I had been in any other jurisdiction at this time. It wasn't because Michigan had loans and I could justify the license contract on that item alone; that never entered into my mind at all.

The Michigan method is not ridiculous. At the time that I developed the figures on that basis, it was the best thing that I had up to then developed, but since then I have developed what I think is a better basis, and, as an accountant,
I have enough pride to change my mind to the thing that
2946 I think is correct, when I find out that a change should be made.

I read the Stockholders' Annual Reports for the period 1921 and 1922 and 1920. I helped write them. I recall there the description as to the computation of costs of the license contract. I don't know very much as to the method used then in determining the cost of funds to the American Telephone and Telegraph Company in the 1919 and 1920 statement. I was not Comptroller then. I worked on the statement in the New York Telephone case presented by Mr. Gifford, showing the cost of funds. We used at that time, in determining the cost of funds, substantially the same basis that we used in Michigan.

"Q. But reflecting now, you think that was also ridiculous?

"A. I didn't say ridiculous. It is not ridiculous.
2947 If you do the best you know how to do at the time it is not ridiculous and any man has the right to change his views if he finds he has been wrong."

Referring to City Exhibits 157 to 157-J, which Mr. Goldstein stated cover the financial data regarding the Central

Union, I couldn't say now whether I prepared them or not. They don't look familiar to me at all.

I know at the time I testified here two years ago, or three years ago, there was some question of Central Union data, but it was my impression that it was decided that that data would not be furnished, as the Central Union situation was not material to the case.

2950 Referring to Exhibit A-16, I include in the investment of buildings twelve million, thirteen million 1923 to 1925, and then I have no more investment in build-
2951 ings. The reason for the change is that our headquarters building at New York which is located at 195 and 205 Broadway, had its first section building built about 1914-1915, I think, and it was owned by the 195 Broadway Corporation, jointly by the American company and the Western Union company; we owned 70 per cent, and the Western Union, 30. Now, later, we needed more office space, and the American company built the section at the corner of 205 Broadway, and for several years it had the deed to that property, to the physical property. That was during the years in question here, 1923, 1924 and 1925.

Now, after 1925, at the end of 1925, this section of the headquarters building was sold to the 205 Broadway Corporation, and after that we owned stock in the 205 Broadway Corporation. So that it passed out of this picture.

The building, while the title was in the American Telephone and Telegraph Company was occupied by some other
2952 tenants than the American Telephone and Telegraph Company. If we received rent, we gave credit for the rent. The Western Electric was a tenant. A jeweler was also a tenant. The Western Electric paid an amount representing the cost of house service, and the interest on the money invested in the building. That is during 1923, 1924 and 1925. The rent was billed to the Western Electric on the cost basis, plus a return on the capital that we had invested.

2953 As to the following statement which Mr. Goldstein

said Mr. Bracelen made in a letter dated September 22, 1931:

"That the basis of rental charge is as follows: with the exception of a few minor leases and fixed rentals, the rents charged to all tenants, including Bell System and others, are based on (a) the cost of operating and maintaining the building, including the depreciation apportioned on a square foot basis; plus (b) taxes, actual interest charges and 5 per cent on the issued capital stock apportioned to the tenant on the basis of an appraisal of the square foot value of space occupied by each, this value being dependent upon the location of the space."

2954 That would be true in the case of the buildings that were owned by the building corporations, and there was stock outstanding. In this particular building, while we had the deed to the property, the rentals would be figured on the basis of our costs, including taxes, depreciation and everything else,—all other things.

The basis of determining how much the Western Electric should pay as a return on the investment in the building was the house service, and depreciation, taxes and interest charges. I don't know just exactly the rate: I think it was 5 per cent.

2955 It was 5 per cent on the money that the American company had put in that building. The Western Electric occupied a certain percentage of that building. And on that per cent or portion of the building, the Western Electric paid rent to the American Telephone and Telegraph Company on the basis of 5 per cent of the investment. The American Telephone and Telegraph Company occupied a certain percentage also. And other tenants, if there were any, occupied a certain percentage.

2956 We give credit to all the rent received. The effect of it is that the difference between 5 per cent that the Western Electric paid and the 6.87 that we charged, the licensees absorb through the license contract. If the Western Electric had paid more, the Western's cost to the companies would have been more. We aim to run the building corpora-

tion on a cost basis, and that is what these figures reflect. We aim to make no money from our tenants in the building corporation, whether it be the Western Electric or ourselves. We make the difference between what we get from them and what it costs us through the license contract, but by the time that difference is allocated to the Illinois Bell, it would be almost infinitesimal. I have never figured out how much it is, but looking at the thing generally, it would not be worth while.

2957 I consider that the buildings down in New York as owned for the licensees' benefit. And they get the credit for all the tenants' rent. I do not consider that the American Telephone and Telegraph Company as a holding company owns that investment, like any other investment, and charges the licensees on the same basis that it charges the Western Electric, because the American Telephone and Telegraph Company as a holding company probably would have needed two or three little offices, if it were simply a holding company. The Western would need just as much space as it does now, if it served the company. But I don't consider this building as being jointly for the Western Electric and for the licensees, because it wasn't built in that way. The Western is just renting space in it, as any other tenant would rent, and we saw no reason why we should pile up rental on the Western Electric, and increase their costs, and increase our revenues, and in turn have the Western Electric's cost go back into the prices of goods sold to the companies.

2958 The Western Electric costs would be distributed between the Bell and the non-Bell customers, but a very small part would go to the non-Bell. That part of the Western's cost which goes to the non-Bell is taken out by the Western before it distributes, and the amount would be so small you would not notice it. There would be a little infinitesimal part.

I don't believe any associated company occupies any of the space. I think the New York Telephone Company had a few pay station telephone booths in it at one time. I don't 2959 know what rental they paid. I think it was on the

regular basis. The statement that all the tenants, including the Bell System, paid on the basis of apportioning the cost plus 5 per cent return, if we made it at the time, is the fact. We would not give you a statement that was not true.

Speaking now about the period, beginning with 1926,
2960 when the title to the buildings was held by the 195 and the 205 Building Corporation, the basis that I computed the rentals as reflected in my exhibits was the same basis as quoted awhile back, it was house service, depreciation, taxes, interest, if any paid; and a 5 per cent dividend on the stock.

2961 Subsequent to 1926, the rental is a computed figure, taking into consideration the taxes, the house service, expenses, the depreciation, any interest which the building corporation pays, and if there is any stock out, we include a 5 per cent return on the par value of the stock; the idea being to compute a rental figure which is a minimum reasonable rental figure. Now, that is simply the yardstick for computing the rental. And that is the rental. Now, that goes into our departmental expense account, and it comes out again, in so far as it represents payment to ourselves, it comes out again in this cost of money used,—or cost of the phys-
2962 ical property used in the business.

That does not reflect itself in my figure on Exhibit A-167, because subsequent to 1926, it doesn't come out, because there are no payments on our own property. But prior to that time, it does come out. Subsequent to 1926, I do not put in as part of the charges against the license contract, first the investment of the American Telephone and Telegraph Company in that stock, and the cost of 6.87, or whatever it is, to procure funds, and give credit for the 5 per cent. All we deal with subsequent to 1926, is the rental.

"Q. Then why do you not use the same methods prior to 1926?

"Mr. Blackman: Well, we are going to ask the Court to do that, Mr. Goldstein.

"Mr. Goldstein: No, I want to show the reason why, in

one case, they have got the title, and in the other case they own stock.

"Mr. Blackman: We think it is the same thing; substantially, and we are going to ask the Court to make us that allowance.

2963 "Mr. Goldstein: With that explanation we are satisfied.

"Mr. Blackman: We have based it on our physical assets, in making this cost, as it was not strictly a cost.

"Mr. Goldstein: We will accept the answer of counsel as an answer to the question.

"Mr. Goldstein: To clear up the record, I stated yesterday that we were advised by Mr. Bracelen that the figures used in arriving at depreciation expenses of the telephone instruments at the 7 per cent rate in 1923 to 1927, were as follows:

"Life, 11 years; and salvage, 24 per cent. Mr. Blackman asked that we produce the letter.

"Mr. Goldstein: Now, here is the letter, the original letter, signed by Mr. Bracelen, dated September 22nd, 1931.

2964 "Mr. Blackman: I have no objection to the letter going in evidence, it is signed by Mr. Bracelen, and I have no objection, but I would like to read the letter before I consent to some characterization of what it says.

"Mr. Bracelen: Well, I doubt whether the letter should go in. It is probably a letter of many pages, containing
2965 many hundred items. If I signed it, I suppose it is all right.

"Mr. Goldstein: We would just like to get the fact in as to the life and salvage on telephone instruments; a life of eleven years, and salvage of 24 per cent.

"Mr. Bracelen: Yes, that is the rate which the witness testified to.

"Mr. Goldstein: No, we are not questioning the 11 years, but we want to make use of the fact that it was 11 years. Therefore, we ought to have the fact in.

"Judge Wilkerson: I guess you have got it in now.

2966 "Mr. Goldstein: Mr. Heiss, to complete the eleven million dollar transaction, we will identify the letter, copy of which was sent by Mr. Braeelen subject to your check, it is a letter from Mr. Blair-Smith, dated March 4, 1924, to the Illinois Bell, as Defendants' Exhibit 117."

I did not include in my exhibits the losses by the Bell Telephone Securities Company in the purchase and sale of securities, or in its operations. My exhibits are absolutely clean of any Bell Securities expenses or revenues. I did not, in any of my exhibits, give credit to the Illinois Bell for selling stock of the American Telephone and Telegraph Company, because the Bell Securities Company does that, I understand. It makes settlement with the Illinois Bell or whatever services are rendered to the Securities Company.

2967 It is my understanding that there is a payment made by the Bell Securities Company to the Illinois Bell for the use of the Illinois Bell's facilities in selling stock to the American Telephone and Telegraph Company. I do not know whether that payment covers special service, special expenses or a portion of the return on investment, taxes, etc. That is a little removed from my jurisdiction.

Referring to a memorandum covering pension fund accruals which we sent to the Illinois Bell, with my letter of September 22, 1931, that memoradum is just as good today as it was when we sent it. The agreement with the Bankers

2968 Trust Company and the American Telephone and Telegraph Company provides a termination of the trust in ten years. That was put in to comply with the peculiar legal situation in the State of New York. That same sort of provision, and the same method, is used by the licensee companies, including the Illinois Bell in connection with pension funds. We would have been very happy, at the time we established this trust, if we could have created a permanent trust, but we could not do it under the peculiar legal situation in New York.

As to whether if in ten years from now the agreement is

terminated, and the American Telephone and Telegraph Company comes into possession of the pension fund moneys, the American Telephone and Telegraph Company would hold it
in trust for pension fund purposes, and for no other
2969 purpose, that bridge has never been crossed, because we don't expect moneys to ever come back.

There is no provision now as to the disposition of those funds, except that which is stated in the company's Employees' Benefit Plan, that these funds will be used for pension purposes, to meet the company's obligations.

Now, we do not figure any ten-year period here, or anything of that type. We would have been glad to have made the trust agreement a permanent agreement, and we did not feel it was necessary to cross the bridge as to what would be done with the funds if they were returned. The agreement I am referring to is the Employees' Benefit Plan.

There are two pamphlets. There is first our Employees' Benefit Plan, which is the Plan we hand to every employee that comes into the business, so that he may know what benefits he gets as an employee of the business. The second is a trust agreement with the Bankers Trust Company.

We will be glad to supply defendants a copy of the
2970 pamphlet, which shows how the American Telephone and Telegraph Company will dispose of the money, apart from the agreement with the Bankers Trust Company. I might add, Mr. Goldstein, that the particular matter that you were referring to is specifically—is covered in Section 4-8,—Section 4, Pensions, paragraph 8.

Cross-Examination (Continued) by Mr. Goldstein.

May 23, 1932.

2973 I had nothing to do with the preparation of Exhibit A-49. My exhibits refer to the Chicago area, or the area involved in this suit.

2975 "Mr. Blackman: And that is, we have made no allocation between interstate and intrastate on these figures.

and the same percentage of interstate will have to be taken out of these as was taken out of the other expenses of the company.

"Mr. Goldstein: All right. Now,—

"Mr. Blackman: That is my impression now. I have not considered it carefully, but I do not think there is much doubt about that.

"Mr. Goldstein: Well, that is the fact we want to establish, whether—

"Mr. Blackman: This fact is certain—

"Mr. Goldstein: —the items of cost—

"Mr. Blackman: This fact is certain, that we have taken out nothing for interstate in producing these figures; we have allocated to the Chicago area on the basis of the people, and the plant.

"Judge Wilkerson: Well, the allocations to the Chicago area so far as distribution between the interstate and intrastate business is concerned, will have to be treated the same as the other items—

"Mr. Blackman: I assume so.

"Judge Wilkerson: —with respect to the Chicago area.

2978 "Mr. Goldstein: We object to each and all of the exhibits offered through Mr. Heiss, beginning with A-150 and including A-169, and the summary sheet to be 2979 offered by plaintiff as A-170, on the following grounds:

"First: That the sources of information from which the calculations therein shown purport to be made, have not been made available to the defendants.

"Second: The exhibits and the testimony show that the expenses allocated to Chicago represent a part of a larger amount of expenses of a pool consisting of many participants who share in some of the same services that the City of Chicago shares in, and in some that the City of Chicago does not share in. No showing has been made as to the character of the services of the pool, whether the other participants pay for the services, and the records have been denied to the defendants from which can be determined whether

the rest of the pool in fact paid anything, whether the expenses for the particular services also furnished in the City of Chicago absorb the entire payment from the rest, whether the services not furnished from Chicago absorb the entire payment from the rest, leaving the Chicago Company to pay all of the expenses of the other services, or leaving the Chicago Company as the only one to pay for services rendered to the others without pay. The records have been denied
2980 from which we can tell the extent to which the alleged pool services benefit the others as compared to Chicago.

"Third: These exhibits contain and have not separated the portion of the pooled expenses admitted to be incurred in the preparation of the reports for many participants in the pool, and for performance of services predicated on the reports from many participants, the character and contents of which reports from such participants defendants have not been given access to, or information about, other than the statement of the plaintiff's witnesses that they are of the same character as those furnished to Chicago, and whose testimony can in no way be checked.

"Judge Wilkerson: Have you anything to say in reply to the objection?

2981 "Mr. Bracelen: If your Honor please, as to the objection that the original sources of information have not been made available to the defendants and their counsel: I desire to make this statement, that we have tendered to the defendants all of the reports which the witnesses have identified in their testimony, and specifically in the case of this witness, those which he has referred to, for complete examination by them. They have been advised that they may see all of these reports in their entirety, that they may check the data contained in those reports which has been used by the witnesses in any way.

"For the most part that data has been used to furnish a basis of allocation of the license contract costs. It seems that that tender would dispose of this objection, the objection to these exhibits.

"But I wish your Honor to know that the tender we have

made has gone beyond that. We have tendered to them for examination in their entirety, all of the reports which they have asked for. I include in that statement the provisional estimate reports for all of the companies. They have
2982 already had furnished to them, as I believe the record shows the provisional estimate reports of the plaintiff. This inspection that I now refer to of the M. R. & C. R. reports and the Provisional Estimate reports, going beyond our exhibits and the underlying data for our exhibits, has been made upon this basis, that if they will indicate that they consider any information upon any of these reports as being material and relevant to any issue in this case, we will consider whether we will permit them to take such information and data from the reports.

"That of course is merely a suggestion for the convenience of everyone concerned. It may be that if they will point out what there is in these reports beyond anything that we have used as a basis for our exhibits, and testimony, which they desire to use for any purpose on their part, we can agree and it will not be necessary to take the time of the court upon that. If we do not agree, then we have stated to them that of course the matter presumably will be presented to the court for a ruling as to whether the data they desire are material or relevant, and are data to which they are entitled.

"I am at a loss to understand how that tender can be in any respect unsatisfactory to counsel for the defen-
2983 dants. It seems to us that it is a complete tender. It makes available to them for inspection all of the reports and all of the information they contain, and we merely ask them in so far as they desire information beyond that which we have made use of, to indicate to us in the first instance, if they will, but if not, to the court, what it is they think they are entitled to have, for a ruling.

"I think that there will be no disagreement between us and counsel for the defendants, as to the accuracy of my statement just made, as to what the tender has been. I may say that in so far as the reports which we have used in connection with the testimony of witnesses who have been on

the stand ahead of Mr. Heiss are concerned, those reports were tendered to them, I think a week ago last Thursday, or possibly it was a week ago last Friday, but they have understood that these reports have been available to them either at the Illinois Bell Company offices, or here in court, in the custody of the clerk, at any time they might indicate that they desire to examine them.

"Now if that tender is not satisfactory to counsel, I
2984 think we are entitled to have them state in what respect it is not satisfactory; and in that connection I wish to say merely this further, that we are very near now to the point of resting our case on direct. I do not mean to hold out any hope that we will do that today, and probably not tomorrow, but I should think Wednesday, provided the question as to the admissability of all of the evidence we have offered is disposed of.

"Of course, we cannot rest until we know whether our evidence is in the record or out, and if any of it so far offered is ruled out we will wish to supply the deficiency, and of course, will do so.

"Mr. Goldstein: Saturday, accompanied by Mr. Rainwater, of the Illinois Commerce Commission, I conferred with Mr. Jones, and had a memorandum prepared—or Mr. Jones, rather, had a memorandum prepared at that time, as to just what transpired. I would like to read the first paragraph of it, which will indicate the whole nature of the tender.

'Mr. Jones stated that he was offering to Mr. Goldstein all of the figures used by the plaintiff in the preparation of its exhibits as hereafter detailed, and that the figures could be copied.

'He further stated that if Mr. Goldstein wanted other
2985 figures, and would indicate what they are, he would consider the matter, and if unable to agree, would submit it to the court.

'Mr. Goldstein asked whether these offered exhibits included any provisional estimate statements and letters of transmittal of companies other than the Illinois Bell, and Mr. Jones stated, no.

'Mr. Goldstein asked what documents and figures were offered and the basis upon which they were offered, and suggested that in view of his unfortunate experience with Mr. Cleveland, Mr. Ohlander and Mr. Rainwater would go over the documents and figures, and should dictate a memorandum containing specifically the terms of the offer; that as soon as this memorandum was typed, Mr. Rainwater would start inspection according to that memorandum and otherwise.'

"On Sunday afternoon there was delivered to us the typewritten memorandum, and there was attached to it a sheet—two sheets which were not part of what was dictated on Saturday, which did expand the offer to include:

'Any other M. R. or C. R. reports not above referred to that underlie these exhibits, and the same offer is
2986 hereby made as to those. The same offer is also made with respect to all such reports, whether or not they underlie or relate to plaintiff's exhibits; that is, counsel for the city may see any M. R. and C. R. reports, also any provisional estimate reports; and if they will indicate what data contained in them they wish to take off, we will consider the matter promptly, and if unable to agree, will submit it to the court.'

"Now the terms of the offer both as to these and also as to the documents which were tendered to us on Saturday, are these: We can look at several thousand sheets of paper that contain figures; on each of these sheets there is one line marked 'total', and that total, which is a summary of probably 25 or 50 figures, may be copied. We may not copy, and so as a practical matter not use, any other figure on the sheet, for obviously, to look at several thousand pages, and to commit them to memory—and even then as a practical matter we could not use them anyway—means as a practical matter that we are limited to checking the mathematical accuracy, and there is no question about the mathematical accu-
2987 racy of a figure; but we are not given any opportunity to make use of any detail involved in that summary which we may desire to use as a basis for our contention; and

therefore, we say that that sort of a tender as a practical matter makes it impossible for us to check the information which they are using as a basis for that character of compilations, unless we accept their theory of the case. If we have a right to look at them, we should have a right to make any test check we want on the basis of the figures, to test out our theory.

"They have used for instance total plant; it may very well be that on our theory, instead of total plant, exchange plant is the proper basis. If we should find that exchange plant is the proper basis, there is not any way we can have the figures because we are only allowed to look at them, and not make use of them.

"Judge Wilkerson: Well, take your last point there: If the figure which they give you is total plant, and not exchange plant, and it should be held by the court in the end that exchange plant is the proper figure to be considered in this particular connection, and that is not in the record, then all of that testimony—

"Mr. Goldstein: No.

"Judge Wilkerson: Does it not lose its effect?

2988 "Mr. Goldstein: No, but the big element in the license contract is going to be this—the big issue is this, and it is for that reason in our opinion that they have withheld the information.

"It will be our contention that as between the various participants in the pooled services, some of these services on our theory of allocation absorb the entire payment, and if we are not permitted to get the information so that we can prove that—

"Judge Wilkerson: Why do you concern yourself about that?

"Mr. Goldstein: Because as between the two bases of allocation—there may be two bases of allocation.

"Judge Wilkerson: But I say, why do you concern yourself about it? They have picked out a theory on which they are justifying this license contract, and if that is not the correct theory, they fail.

"Mr. Goldstein: No, they may have a theory—pardon me.

"Judge Wilkerson: But it is not for you, you are not required to establish what the facts are on some contradictory theory. If their theory is right, and they have all of the facts in the record that are pertinent on that theory, they win; and if they have not all the facts in, they lose on
2989 that license contract, that is all.

"Mr. Goldstein: No, but—

"Mr. Haight: So far as that goes, that is very well, but they are in a court of equity, and they have announced through counsel in court that their policy is not to reveal or disclose except as they are forced to, and we have a perfect right in a court of equity, where the suitor comes in here asking for relief, to investigate, to support our theory, and not to be left only to the negative position that that course suggests.

"Mr. Goldstein: There is specifically—they have come into this court, and they have eliminated in this case—

"Judge Wilkerson: If the whole license contract allowance should be thrown out, they lose this lawsuit.

"Mr. Goldstein: They have come into this court, and they have adopted a theory within the last few days which eliminates the question of loans. Now, if we have these figures we can show that the losses on those loans to the other participants, absorb the entire payment. We need no argument as to whether it is proper or not. By withholding the information, they prevent us from pointing out to this
2990 court the importance of these other services that the others are getting, that are not made available to us, or that we are not participating in, and therefore, we are left only to argue as a matter of logic, and not to use the facts, the experience of the companies, as to what has been going on.

"Judge Wilkerson: Well now, what is the total volume in point of physical size of these papers to which you want access?

"Mr. Goldstein: They are offering us access—why should they worry how long it will take us to copy them?

"Judge Wilkerson: Well, how large an array of documents is it?

"Mr. Bracelen: Well, your Honor,—

"Judge Wilkerson: Because I cannot see—they have put in their case on a certain theory; they introduce evidence which they say sustains that theory; and they say this other information on their theory has no place in the record at all.

Now in order to get any benefit from their documents, they must have established their theory of the case. If their theory falls, then there is no evidence.

"Mr. Goldstein: But suppose there are two theories.

"Judge Wilkerson: Well,—

2991 "Mr. Goldstein: Why should we be limited to their theory?"

"Judge Wilkerson: I say, if their theory is erroneous, their case falls. On the other hand, you say you want to examine these documents to build up a case on another theory. That necessarily means that these documents get into the record, because if you can look at them, the Court has the right to look at them, and the Court must look at them in order to see whether you have properly applied your theory. That is to say, if they are the figures which you want to use, the Court must look at them if you look at them. That brings us to the question suggested here the other day, whether after all the Supreme Court in this case has laid down a rule under which nobody situated as this plaintiff is, can make out a case. That is what it amounts to.

"Mr. Goldstein: So far as he wants to use the pool figures—

"Judge Wilkerson (continuing): Because if they laid down a rule under which this record must be multiplied so that there are tens and hundreds of thousands of pages in the record, it simply makes it impossible within the limitations of time which a court has at its disposal, to consider a case of this kind.

2992 "Mr. Goldstein: It is our contention—

"Judge Wilkerson: The case is so large—

"Mr. Goldstein: —they have used that method of procedure—

"Judge Wilkerson (continuing): If would fall of its own weight. That is the situation, if your theory is followed out.

"Mr. Goldstein: Now they have used a method of proof to comply with the Supreme Court, which involves the use of these documents. Now they cannot withhold the documents from us on the theory that it is going to clog the record, when they use the same documents for their theory.

"Judge Wilkerson: Well,—

"Mr. Goldstein: And we have a right to offer them in the record for that purpose. Now if they can go in the record for their theory, why should they object to us having access to them on the thought that they would go in the record?

"Judge Wilkerson: After all now, the question is as to the admissibility of these particular documents, and they are offered here as tabulations—

"Mr. Haight: I think it narrows down to something that may obviate the necessity of the introduction of the 993 documents entirely. It narrows down to this: they say, 'You look at a sheet of paper, and you use only one figure.' We say, when we look at that sheet of paper, we want the opportunity to use other figures in order to check—

"Judge Wilkerson: Yes.

"Mr. Haight: That is where we land.

"Judge Wilkerson: Yes.

"Mr. Haight: If that can be resolved, the difficulty of introducing the documents can be resolved.

"Judge Wilkerson: But the difficulty is this: if you look at these other documents, or these other figures, and you do not agree as to the conclusion to be drawn from them, then you get them into the record, you get them into the case; they must be copied into the record, and you pile up here a record which is measured, not by volume, but by carloads.

"Mr. Goldstein: Then their tender resolves itself into the offer, solely, of the total figure, if that is correct.

"Mr. Bracelen: No.

"Judge Wilkerson: Well, after all, is not this true, that if your theory of the evidence in this case is correct, this case simply cannot be tried in any court.

"Mr. Goldstein: No, our theory is that if they use
2994 that method of proof, they have got to take the legal consequences of it.

"Judge Wilkerson: All right.

"Mr. Goldstein: They cannot use a summary total.

"Judge Wilkerson: They may have to take them.

"Mr. Goldstein: All right.

"Judge Wilkerson: I am not saying.

"Mr. Goldstein: All right.

"Judge Wilkerson: It may be the court will rule that way in the end, but the question here is as to whether these documents should be received in evidence.

"Mr. Goldstein: Well, we—

"Judge Wilkerson (continuing): Or wether you are entitled to have them ruled out because they have not granted your request for inspection. Now, your request for inspection has been denied up to the present stage of the case by the court.

"Mr. Goldstein: Yes.

"Judge Wilkerson: The Court, not the judge sitting, has passed upon your application for inspection. They offer tabulations of the figures which they have used. It seems to me the documents are admissible in evidence. I am not passing now on the weight to which they are entitled, or as to whether they are entitled to any weight or not. It
2995 may be that in the end the court would reject them entirely from consideration, but just now the question is whether they are to be received in evidence, as tabulations of something which the court has said you have the right to know, but has denied you the right of inspecting certain other documents.

"Mr. Goldstein: Well, it is our position that the manner of their tender resolves itself into a tender of one figure on the sheet, which itself is a summary, without any opportunity

for us to use a pencil, to even see whether the additions were correct, or to make use of them.

"Mr. Bracelen: No, no.

"Judge Wilkerson: Now then, I shall admit these documents into evidence, and overrule your objection, and you may save your exception.

"Mr. Goldstein: All right.

"Mr. Bracelen: I submit, your Honor,—

"Judge Wilkerson: Now with the document in the record, the documents having been received formally in the record, if you desire to renew at any time before the entire court, your motion for further inspection of the documents, you may do so. I cannot deny you that right because the documents are here, now, they are in evidence, they have been received.

2996 "Mr. Bracelen: I wish to make this statement, which is a repetition of what I said at the outset, that we are concealing no figure from them—and I want to be sure that counsel understand our position and that the Court understands it. We have tendered to them, and we now tender to them every report they have asked to see. The list of the reports, as I have it in mind, was read to Mr. Heiss when he was on the stand on Friday. The list of reports is the same as that which was contained in the motion to produce, which was argued before your Honor and Judge Evans some two weeks ago.

"We tender to them now, as we have done heretofore, every one of those reports; they may see them freely, and see everything, every figure that they contain. Insofar as we have used certain total figures to which counsel has referred now, and those reports contain specific or detailed figures which go to make up the total, they may check the total, they may use their pencil and paper to whatever extent they please, they may take off the figures that we have used for the purpose of checking our exhibits.

"Now, that all goes to the competency of the exhibits which we have offered. That is one question.

2997 "Now, then, separate and apart from that question,

is their demand for other data contained upon those reports, which we have not used. Our offer to them is that they indicate to us, if they will, what figures upon those reports they consider material and relevant to this case. If they will do that, we may agree. Failing to agree, the matter is to be submitted to the Court for a ruling. No fact or figure is being withheld from them or concealed from them.

"Now, I am utterly unable to understand why that is not satisfactory. But the point I wish to make is that no figure upon any of these reports is being withheld from their inspection and examination. I am not going to take the time now, unless it seems to become necessary, to take up those various reports,—

"Mr. Goldstein: May we introduce this memorandum, which will show the terms of the offer?

"Mr. Bracelen: Please do not, now; I am not going to be very long.

"Mr. Goldstein: Pardon me.

"Mr. Bracelen (continuing): —to discuss those report forms which were before your Honors when the last 2998 motion to produce was argued here. Your Honors, your Honor and His Honor, Judge Evans, examined those somewhat during the course of the argument.

"Judge Wilkerson: Yes.

"Mr. Bracelen: And it appeared that they contain an enormous mass of detailed and specific data of all kinds pertaining to the plant, to the property and the business of every operating telephone company of the Bell System, beginning with the New England Telephone and Telegraph Company, and sweeping across the country. And it seemed to us, and it then seemed to the court, that obviously not all of that information should be brought into this case, which involves an issue here as to rates in the City of Chicago. But let there be no mistake about our position. If there is anything upon any of those reports which they desire in addition to the figures which we have used, let them indicate to us, or to the court, what figure they desire. It may be that we can save your Honor the necessity for any consideration of the matter.

It may be that we will give them the figure, possibly, whether we think they are entitled to it or not. But at all events, they need only indicate what they want, and ask for a ruling.

"Now, we are not standing upon the position that they
2999 must force something out of us. On the contrary, we are tendering them all of these reports, and they have understood that, and in fact, the statement which Mr. Goldstein read from, the memorandum which was prepared by Mr. Jones in consultation with Mr. Goldstein, so states very clearly. But after stating the tender correctly, as I think Mr. Goldstein did, then he proceeds to say that we are withholding something and concealing something. The tender is in direct contradiction to that statement, your Honor.

"I think the record is clear upon it.

"Judge Wilkerson: Well, the difference between you, as I understand it, is simply this: You have offered an inspection of certain portions of the documents.

"Mr. Blackman: No, sir, the whole of them.

"Mr. Bracelen: All of them.

"Mr. Blackman: The whole of the documents.

"Mr. Bracelen: All of them.

"Mr. Blackman: The whole of the documents in every case.

"Judge Wilkerson: What more do you want?

"Mr. Bracelen: (Continuing) Every document.

"Mr. Goldstein: But we cannot make use of it. We can look at a thousand documents, and what good does it do
3000 to look at them if we cannot use a pencil to make any test?

"Judge Wilkerson: What do you want to do—

"Mr. Goldstein: (Continuing) Or do anything with them.

"Judge Wilkerson: What do you want to do?

"Mr. Goldstein: Just read them.

"Judge Wilkerson: Do you want to take them away?

"Mr. Goldstein: No. But we would like to have the opportunity to work on them, and if there is for instance any portion of the detail that we think is relevant, we want to have the right to use that figure.

"Mr. Blackman: And we say, sir, if they can point out to us

"Mr. Goldstein: Well,

"Mr. Blackman: or to you

"Mr. Goldstein: is your offer

"Mr. Blackman: any reason for that

"Judge Wilkerson: Yes.

"Mr. Blackman: we will allow it

"Mr. Goldstein: Is your offer

"Judge Wilkerson: The point is this. You say they must point them out to you

"Mr. Goldstein: Yes.

"Mr. Blackman: Yes.

3001 "Mr. Goldstein: That reason

"Judge Wilkerson: (Continuing) What it is about; that they must point out to you what it is, as to which they desire information

"Mr. Blackman: Yes, sir.

"Judge Wilkerson: And they say they wish the right to fish, to see whether their examination

"Mr. Blackman: Exactly.

"Mr. Goldstein: No.

"Mr. Bradelen: Yes.

"Mr. Blackman: Exactly.

"Mr. Goldstein: No.

"Judge Wilkerson: Whether they want

"Mr. Goldstein: Let us

"Mr. Blackman: Now the point comes down to this

"Mr. Goldstein: We say this, that we cannot tell what we will want until we make a test to see how the figures will line up. We may have a theory, and our theory will not be worth anything unless

"Mr. Bradelen: Precisely, sir.

"Mr. Goldstein: (Continuing) -until we know where we stand on it. We have to know the significance. We do not want to burden the court with too much—

"Judge Wilkerson: There is a word that has been used

from the earliest decision, that applies to the thing that
3002 you say you want to do.

"Mr. Braeelen: Precisely.

"Judge Wilkerson: There is something to that effect in an early decision, which applies.

"Mr. Braeelen: Precisely.

"Mr. Haight: We do not want to fish.

"Mr. Braeelen: That is precisely the point.

"Mr. Haight: We simply do not want to be denominated as that particular kind of fish that comes up the Illinois rivers early in the spring, from which this state gets its name, that is all.

"Mr. Goldstein: May I ask whether the terms of the offer this morning, are any different

"Judge Wilkerson: Well, I do not think anybody could accuse you of being a sneker, Mr. Haight.

"Mr. Goldstein: May I ask whether the terms of the offer are different than those contained in this memorandum? If the terms of the offer are contained in this memorandum, we want it identified as Defendants' Exhibit D 118.

"Judge Wilkerson: You may have it identified.

"Mr. Goldstein: All right.

"Judge Wilkerson: I have ruled

"Mr. Blackman: Your Honor, I think the whole thing

"Judge Wilkerson: I have ruled on the whole thing.
3003 "Mr. Goldstein: And we preserve an exception.

"Judge Wilkerson: And I have said that if counsel desire to make a motion after the documents have been received in evidence, relating to further inspection, and it is done in the proper way, and on a proper showing, I will have my associates on the bench convene at some convenient time and consider the application. But it will have to be presented in the regular order, and supported by a proper showing."

(The document was thereupon marked Defendants' Exhibit Number D-118, for identification.)

"Mr. Blackman: So that we will have the record straight, if your Honor please, I will re-offer in evidence the plaintiff's exhibits that have been submitted to the court. Exhibits A-150

to A-169, both inclusive. I will also offer in evidence the tabulation of royalties, which was identified by Mr. Goldstein
3004 as Exhibit D-111. That will be Plaintiff's Exhibit A-171.

"Mr. Haight: If your Honor please, we ask that our objections already placed on the record stand to the offer at this time.

"Judge Wilkerson: Overruled. It will be understood in this case I suppose, as it is always understood in an equity case, that where the court overrules an objection, it in unnecessary to formally note an exception of record. At least in this case the point will be treated as saved, whether counsel formally notes an exception or not.

"Mr. Haight: We will be very glad to do that. Is that agreeable to you also, Mr. Blackman?

"Mr. Blackman: Oh, yes."

(The documents were thereupon received in evidence as Plaintiff's Exhibits A-150 to A-169, both inclusive, and Plaintiff's Exhibit A-171.)

3005 *Re-direct Examination by Mr. Blackman.*

I was asked by Mr. Goldstein with regard to the sale to the Long Lines Department of telephone instruments in 1927. There was no sale, nor could there have been any sale to the Long Lines. Those few instruments were merely transferred on our books to the Long Lines Department accounts. The Long Lines is a part of the American Company, and the American Telephone and Telegraph Company owned the instruments before this date and continued to own them afterwards. They were simply continued on the books of the Long Lines on the same basis that they had previously been carried upon the books.

I stated in answer to Mr. Goldstein that there was no
3006 relationship between our depreciation expense that we carry on the books of the American Company and the license revenues which the associate companies pay. We do not charge up on our books any specific amount for any specific service under the license contract to any associated com-

pany, or against the license contract as a whole. My books show the license revenue received from the companies, and in an entirely separate and distinct book of records, we show the expenditures that we incur in rendering that service as a whole but not allocated to that service. That is, those expenditures are carried on our books just like any other expenditures.

Mr. Goldstein asked me whether prior to December 31, 1927, the associate companies could purchase telephone instruments from the Western Electric Company; that is he said they could not purchase telephone instruments from the Western Electric Company, and I said "That is correct". I will
3007 amend my answer to Mr. Goldstein; they could purchase instruments, but they would have been decidedly foolish to have done so when the instruments were being made available to them under the license contract and they were paying for them through the license contract payment.

I was asked with regard to the experience of the Company with the so-called hand set or cradle telephones since 1927 and I said I did not have the figures, but would look them up. I have familiarized myself generally with them. I think there are now somewhat over a million hand sets in use, slightly over a million in use throughout the Bell System, or about 18 per cent, I think, of all instruments in use. That is, in the six years that they have been in use they have increased to a point where they are now about 18 per cent of the whole.

3008 I read a portion of a letter from the President of the Illinois Bell, in which this phrase occurred:

"The completion of this program during 1924 will require $7,636,000 beyond our estimated current resources, but will not require any new finances."

That was merely a statement by the President of the Illinois Bell Company that, in respect of a large construction program which he had for 1924, no further arrangements for financing that program were required, because he knew that he had loaned to the American Company at the beginning of 1924 in excess of $10,000,000, and he also knew that that money could be withdrawn from the American Company; or, in other

words, that if he asked the American Company for the money, they would repay the loan to him at any time that he wanted it, and that he had, therefore, his construction program amply covered as to finances.

3009 In answering a question about the cradle phones in use, I said that they were 18 per cent, and about a million in number. I made an error there. The 18 per cent is right, but the number is 2,800,000 instead of 1,000,000.

I was asked concerning a contrast made by Mr. Goldstein between the rate of 5.53 which the American Company paid to the Illinois Bell in 1924 and the rate of 5.88 which the American Company customarily receives for money which it advances to the associate companies. When the American Company advances funds on demand notes, or on open account to its associate companies, on the 6 per cent basis (that is, 6 per cent less 2 per cent for prompt payment of interest monthly), it advances those funds with the full understanding that
3010 they are to go for all practical purposes into new construction and new additions to property and be permanently separated from the American Company, or that the money will be permanently invested in the Illinois Bell plant or the plant of any other associate company to which the money is advanced. That is, the American Company cannot get it back if it wants it back; it hands it out, it advances it with the understanding that the transaction is final. But on the other hand, the company receiving it has the opportunity to repay it at a later date before these advances go into more permanent financing, such as stock; if the associate company that has received the money has in its possession spare funds, that is, if there should be funds left from earnings, or from other sources, or if property should be sold, or if for any reason the associate company has money, it can repay to the American Company the advance which was made on the 6 per cent basis. But the American Company from its point of view does not expect that the money will be repaid.

3011 Now, take the other transaction, the receipt by us of moneys from the Illinois Bell and the payment of 5.53: In 1924 we received slightly in excess of $10,000,000, and we

paid the Illinois Bell 5.53 for the money. Now, the 5.53 rate in the first instance was the cost of that money to the Illinois Bell Company, and in taking it off of the Illinois Bell's hands, we assumed the burden of carrying that money until the Illinois Bell required it in its plant. I say, we assumed the burden; that is not quite a fair statement. We relieved them of any loss on that money during the period from the time they sold the bonds until they subsequently needed the money in the business.

3012 Such money as we received from the Illinois Bell, or any money that we held in New York for the companies, we had, of course, to keep in rather liquid form, and on that class of money that we received in 1923, we received in that year 3.51 as an average on all the money held during the year. Now, that is understandable for this reason: When we had funds of that type in our possession, the money that we had loaned from the Illinois Bell with the understanding that we would repay it as they needed it, or money that we might have gotten from our stockholders to invest in telephone property with the commitment to invest it in telephone property, we did not in respect to that money have any right to speculate or to look around for some long-term investment that might yield 5 or 6 per cent, or to use for call money transactions. In fact, we have never put any money in any call money transaction. But we feel an obligation to put that money into such forms of investment as government securities and treasury certificates, and short term state and municipal paper;

3013 something that we can on a few days' notice collect on, and yet at the same time it will be an investment that embodies all of the factors of safety, integrity and maintenance of the principal. Now, on that type of money, of course, the rate that is paid is low.

So that during all of the time we were actually holding that money in our possession as money and paying a 5.53 per cent return on it, all we were getting was 3.51 on the average for all money. In 1924 we got 3.15; in 1923, 3.51.

In making up my exhibits where I show the amount of the cost of this money to the American Company and allocate a

part of that cost to the Chicago area, as to whether I first give full credit for all of the money that we received, I will take, for example, the matter of holding funds available, in that category. If we are holding, say, $70,000,000 of funds available, on the average, through the year, and those moneys produce a return to us, invested as I have just described, of,

say, 3.5 per cent, we give full credit for every dollar
3014 earned by the American Company on that money in computing our cost of carrying that money for the companies. In other words, if that money cost the American Company as a whole 6.8, and we earn on it 3.5, then we figure the cost as the difference between 6.8 and 3.5, or 3.3. That is the percentage which we use to determine the cost to us of carrying that money.

It is those figures which I have used in my exhibits, both for the cost of holding money available and for the cost of temporary financing. I might say that in the case of temporary financing we give credit in our computations for the 6 per cent rate that we receive, or 5.88 with a discount for interest, so that if money cost us 6.8 as a whole on all of the money used in the business, and we receive on this money put out on the temporary financing basis 6 per cent, your percentage, or your factor of loss there is only the difference between the 6.8 and 6 per cent, or only .8 per cent. That is the only thing

that I have used in my exhibits. Now, one further
3015 thing: In the matter of cost of carrying physical property, there instead of crediting any interest we credit the rents that we have on those properties.

In answer to Mr. Goldstein I gave certain figures with regard to our financing of the Illinois Bell in the year 1926. In the year 1926 we furnished the Illinois Bell Telephone Company $13,500,000, gross. There was repaid to us during that year $2,700,000, made up of four payments; January 21st we received $1,000,000; June 9th, $250,688; October 20th,

$749,312; and on December 23rd, $700,000. The service
3016 rendered was the service of making available to them $13,500,000 in that year. The net amount that they took

after giving credit for all repayments was $13,500,000 less $2,700,000, which would be $10,800,000.

For the year 1926 my computation, Exhibit A-169, shows that the part allocable to the Chicago area was $4,211,000. Now, that is approximately 70 per cent, which would mean about $6,000,000 was held available that year for Illinois Bell Telephone Company. The Chicago area is about 70 per cent of the entire Company, which would mean for the Illinois Bell as a whole about $6,000,000. In making my allocation for the year, I disregarded the fact that they had actually received $13,500,000 as gross and $11,000,000 as net and charged only on this $4,200,000; that is, we held a certain amount.

We arrived at that $4,200,000 in this way: We took the total money that the American Company held in its treasury
in more or less liquid form available for advances, and
3017 we excluded from that an amount of $6,500,000 which we
were holding for our general purposes, and we took the rest and allocated it to all of the companies on basis of a composite ratio of estimated requirements, plant investment and gross additions. In other words, we would not have held available in New York on an average through the year an amount of money equal to the total estimated requirements of the companies. We hold as little as possible, and yet enough to see that the needs of the companies can be met at any time; and also another factor, we cannot finance any time, or any moment that we want to finance. In financing such a large undertaking as the American Company has before it, they must pick their times of financing, so they get money on the very best basis they can get it on. So we aim to hold what in the judgment of the management is a minimum amount and yet an amount that is adequate to meet the programs of the companies as they come along without embarrassement to them; and that minimum amount or that adequate amount for
meeting these requirements is allocated to the companies
3018 on the basis of a composite of the estimated require-
ments, gross additions, and plant in service.

In the year 1926 our average earning on money was 3 per cent straight. So what I carry in my exhibit is the difference

between 3 per cent and the cost of the money in 1926 applied to this amount of $4,200,000.

The estimated requirements of the Illinois Bell for 1926 were given to us as $15,612,000.

I was asked certain questions by Mr. Goldstein with regard to the years 1923 and a part of 1924, and the last years of the period. The situation which he brought out there is not in any way typical of the conditions that existed during the period in between. The earlier period was one that involved the bond financing transaction of the Illinois Bell; that is, the Illinois Bell put out a bond issue of $50,000,000. It
3019 would have been foolish for the Illinois Bell (which had, I think, a $19,000,000 or $20,000,000 bond issue to retire) to go to all the expense of bond financing and to just have issued a $19,000,000 bond issue when at the same time it had also about $19,000,000, $18,000,000 or $19,000,000 of notes to pay for the purchase of property. In order that it would have a round figure for a bond issue and have money for the future, a bond issue of $50,000,000 was deemed wise at that time and that left it temporarily with funds upon which it was paying 5.53. We took those funds at the same rate and relieved it of any possible loss on the funds until they needed them. We fed them back in small amounts over the year 1924, and,
3020 at the same time, in safeguarding that money we had the obligation to keep it so invested that it was available at any time the Illinois Bell wanted it.

The period, say, from 1929 to 1931, so far as the Illinois Bell is concerned, was also a very unusual period. I recall very distinctly coming to Chicago (I think it was early in the summer of 1929) and discussing with Mr. Abbott the matter of financial requirements for the latter part of the year 1929, 1930, and the future. Then the depression had not yet come into the picture. It was thought by the President of the Illinois Bell that with very heavy construction requirements ahead, as he then saw them and had every reason to believe that he would need them, a forty-million-dollar stock issue would not be an unusual financial program, but that the program should be spread out over the period in such a way that

he would not receive the money that was paid in on the stock until after he had borrowed money from the American
3021 Company and carried it for brief periods on a 6 per cent basis. It was deemed wise to put out the $40,000,000 issue, and that was announced, I think, in the summer of 1929. Approval was obtained from the Commission, and the issue was announced. The first installment was, I think, $20,000,000 or $19,000,000 (it was a 50 per cent installment). The American Company's first installment amounted to nearly $20,000,000.

Now, up to that time the Illinois Bell had borrowed from us nearly $20,000,000, so that when the first installment was due the funds that they had already borrowed from us were simply repaid to us as an offset against the first installment on the stock, and the notes were cancelled. Now, if Mr.
3022 Abbott had decided at that time to put out two stock issues of twenty million dollars, when the first installment of nineteen million odd was paid, if the stock had then been issued, it would have been on the same basis as any other stock that was outstanding. But the stock was not to be issued until the forty million was paid, so that there was paid on the installments the 8 per cent interest which was paid to all stockholders.

Now, it was the plan that between the payment of the first and second installments there would be required by the Illinois Bell something in the nature of more than ten million dollars, which we were to advance on notes at 6 per cent. We did advance money, but the business depression came in and the Illinois Bell's needs were not as great, so that by the time the second installment came into the picture we had, I believe, advanced only between two and three million dollars. I am speaking now of early in 1930. Now, the second installment was due, I believe, in June or July of 1930. The Illinois
3023 Bell did not need the money it had asked for, because of the depression. Another situation crept in the picture, and that was the inability of the Illinois Bell to pay its taxes in the City of Chicago, with the result that for the years 1930 and 1931 we found ourselves with from eight to ten or

twelve million dollars of funds that we had taken off of the hands of the Illinois Bell and carried for them at 6 or 5.88 per cent, when the American Company was not getting over 2½ and 3 per cent on the money.

At page 2810 of the record I am quoted as having made this statement: "All those amounts they had the convenience of paying back to us through the years, and reducing their interest charge $2,700,000. Now, in my estimated requirements I show that their requirements were $13,500,000." I am not correctly quoted there. That situation refers to the year 1926 and what I said was this: "That we had advanced them, the Illinois Bell, $13,500,000, and had given them the opportunity of repaying any amounts that they might have available, and that they had repaid during that year $2,700,000, thereby reducing their interest charges." The interest charge was nothing like $2,700,000. The $2,700,000 refers to the principal amount paid back of the thirteen million five in order to save interest thereon.

I was asked concerning the course of the transaction when the American Company bought a patent and gave a license to the Western Electric under that. In reading the record I find that apparently I did not state that whole transaction. The question that was asked me was that if the American Company paid, say, $250,000 for a patent, and gave the Western a license thereunder, whether the Western paid the American Company $250,000, and, if so, what was done with the $250,000. I should have made this distinction: that under any patent which the American Company buys, the Western Electric receives a license, but that the Western Electric reimburses the American Company only for the cost of acquiring the patents in those cases where the patent is one that should go to the Western. For example, a patent pertaining to telephone apparatus and appliances, something with which the Western deals, should go to the Western, and, in that case, if the American Company buys such a patent, it bills the cost of it to the Western and gives the Western a license under that patent, the Western reimbursing the American Company for the full cost. But if the

American Company buys a patent which is related to the telephone, or anything entering into transmission, why, the cost of that patent under the license contract is borne by the American Company, and no part of it is billed to the Western Electric, but the Western is given a license to manufacture under that patent.

Those charges for purchasing patents for the years 1923 to 1931 that were shown on the exhibit of the expenses of the Law Department are expenses that were paid by the
3026 American Telephone and Telegraph Company and were not passed on to the Western Electric, because anything that was passed on to the Western Electric was repaid by the Western Electric and has been credited in my costs, with the exception of a few small amounts which are shown on the royalty statement D-110, I believe, or 111.

I was asked whether the reason I had included the plant investment as one of my factors in making this allocation of cost of money was not because the Illinois Bell had very small estimated requirements and a large plant. It is not a fact that it did have very small estimated requirements. The estimated requirements of the Illinois Bell are relatively as large as the requirements of any other company. And, of course, they may vary from year to year. Some years they may be slightly below, other years slightly above, but, taking it throughout the period, the Illinois Bell's requirements are proportionately just as large as any other company's requirements.

I was asked concerning a forty-eight million dollar dividend of the Western Electric to the American Telephone
3027 and Telegraph Company, or received principally by the American Telephone and Telegraph Company as its principal stockholder. As I understand the situation, one major source of that money was the sale of the International Western Electric property. Then, in addition to that, I believe there were some additional earnings that the Western had accumulated in the non-telephone field over a period of many years in the past, so that this $48,000,000 was just a house cleaning by the Western in connection with the sale of

the International Western Electric property and certain non-Bell earnings, or non-telephone earnings that had accumulated over a great many years in the past.

The sale of the International Western Electric took place about 1925. At that time the International Western Electric had a surplus on its books which it had built up from undistributed profits throughout the period of its existence. Just

3028 what that surplus was, I am not in a position to say. I know it had a substantial surplus. In that sale, of course, that surplus was taken into account and paid for by the purchaser and when the property was disposed of the surplus was distributed to the American Telephone and Telegraph Company through this dividend, and this forty-seven million dollar dividend, I may say, was included in the surplus that I have credited in my computation of average cost of funds. That is, every dollar of this forty-seven million dollars has been used to reduce the average cost of funds used by the American Company in the business, and that is also true in respect of the fourteen-million-dollar item shown on our books as the result of the sale of instruments. It has been applied to reduce the cost of money used in the business.

3029 In developing my cost of money, I used, largely, the stock of the company and the surplus. I was asked concerning the stock issues of the company. I have prepared a tabulation which shows all of the stock issues and what was received for those issues. That is the sheet marked for identification Exhibit A-172.

This statement (A-172) is an analysis of the capital stock of the American Company, to show to whom it was sold, how it was sold, in what connection and substantially when it was sold, and the consideration received, as well as the amount of premiums realized in excess of par value. For example, in the upper section there is a block (a), sold to American Bell Telephone Company. The first item of $17,500,000 was sold for money. I may say that the American Telephone and Telegraph Company was organized in 1885, and from then to 1900 all of the stock that was in issue was taken by the American Bell Telephone Company. The first block of $17,000,000 was

sold for cash. The next block of $2,500,000 was issued
3030 for a franchise, the third block, put out between 1889
and 1900, was issued for cash, and in 1899 to 1900 there was issued $51,772,600 par value to acquire the stock of the American Bell Telephone Company; that is, two shares of American Telephone and Telegraph Company stock at a par value of 100 were issued for each share of American Bell Telephone Company stock, which stock had a book value in 1900, when this transaction took place, of $228 a share.

In the second block is shown, first, the stock issued in conversion of bonds. There were four convertible bond issues under which we finally issued $426,952,100 par value of stock for a consideration of $643,116,764, or at a premium of $216,164,000, roughly. We got $216,000,000 more than par for our stock in that case.

Now, I may say, as regards the first block at the top of the page, we received more as a consideration than $83,883,000, but those who were responsible for the accounting back in those days did not record the excess as a premium and the excess is in our surplus accounts.

Then, we exchanged $6,000,000 of American Tele-
3031 phone and Telegraph Company stock for $7,500,000 of
Bell of Pennsylvania stock. The American Telephone and Telegraph Company stock at that time was paying an 8 per cent dividend, and the Bell of Pennsylvania stock was paying a 6 per cent dividend. Then, we issued $15,000,000 in exchange for the common stock of the Teletype Corporation in 1930, and we issued under circular offers to stockholders, both through subscription and by selling unsubscribed, $1,148,976,600 par value at a premium of $5,016,394, and under our Employees' Stock Plans the last ten years we have issued $185,024,400 of par value at a premium of $30,887,527. Now, the figures in the last line at the foot of the page correspond with the figures in the published annual report to the stockholders for the year 1931.

With regard to this Teletype transaction, we have received cash, or the equivalent of cash, for the entire $30,000,000.

(Plaintiff offered in evidence document marked Plaintiff's Exhibit A-172.)

3032 *Re cross Examination by Mr. Goldstein.*

Prior to 1927, the associated companies could purchase telephone instruments from the Western Electric if they wanted to; that is my understanding.

"Q. I would like to read to you from City Exhibit 60, the contract of 1882 between the American Bell Telephone Company and the Western Electric Company, and I will ask you, after I have read certain sections, whether you are still of the same opinion, that the licensees could purchase telephone instruments from the Western Electric. Page 2069 of the record, volume 6, provides that the first party, and the first party is the American Bell Telephone Company, agrees that it will employ the said second party, that is, the Western Electric, during the existence of this contract, to manufacture telephones required by it, the American Bell Telephone Company, whether for use in the United States or for export, upon

the terms and conditions following, that is to say: and
3033 then there are provisions as to the price, and so on, and then the last section is, or the second to the last section is, 'Except as in this article provided for, the second party shall not engage in the manufacture of telephones within the United States'. Now, if you care to read that, you may

"A. I can't get anything out of that.

"Mr. Blackman: What was the date of that contract?

"Mr. Goldstein: 1882.

"Q. Do you know of any modification of that agreement?

"A. Well, you have read such a sketchy section of it there and I am not an attorney."

I have read the contract between the American Bell Telephone Company and the Western Electric. I am not competent to pass an interpretation of this contract. My opinion is just as I have stated it, that there was nothing that would prevent the associated companies from buying telephones

from the Western Electric prior to 1927 if the asso-
3034 ciated companies had wanted to be foolish enough to do so. I did not take these agreements between the Western Electric and the American Bell Telephone Company

and the American Telephone and Telegraph Company into consideration at all. I am stating what was my understanding of the situation. I have read the contract between the manufacturer and the American Telephone and Telegraph Company and I know of nothing in it that would change my opinion. My opinion is with such knowledge as I have of the situation.

I said generally the estimated requirements of the
3035 Illinois Bell were relatively as large as those of any other company in the System. I didn't say they were larger. In order to check that opinion of mine that it was relatively as large, it would not be necessary to check the estimated requirements of each of the licensee companies as compared to the total. All you need to do is to look at C. R. 13 compiled by my department, which defendants have had available for many months.

C. R. 13, as I have stated before, was compiled from the provisional estimates together with other data, so unless you accepted C. R. 13 you would go back to the provisional estimates of the other companies, and if you didn't accept
3036 the provisional estimates, you would have to go back to the basic data of the company. At least you would have to use the provisional estimates if you didn't accept C. R. 13.

There are twenty-five companies in the System that we finance. You would not have to compare the Cincinnati Suburban, I think, because they borrowed very little from
3037 us. I have seen people who could make that comparison and keep all the figures in mind without using a pencil. I don't know whether I could.

The gross advances by the American Telephone and Telegraph Company to the Illinois Bell in the year 1926 were $13,500,000. I would say that is an average condition.
3038 If you will look at 142-C, you will find the figures stated there. I said those years where the advances were made to the American Telephone and Telegraph Company were unusual financial relations with the American Telephone and

Telegraph Company, because they are the outgrowth of unusual conditions existing in those years.

3039 The gross advances which the Illinois Bell Company asked the American Company to borrow from it through the year 1931 were $17,620,702, of which the American Company in that year paid back a substantial sum in thirteen different transactions. The Illinois Bell asked the American Telephone and Telegraph Company to borrow $17,000,000 from the Illinois Bell, or to put it this way, the Illinois Bell said, "Here we have $17,000,000 that we don't know what to do with unless we put it into banks and get what we can for it, 2 or 3 per cent. Will you take it?" We said, "Yes, we will take it, and we will pay you 6 per cent on it, or 5.88."

3040 That money was not the proceeds of the sale of a stock issue. There might have been in the very early part of the year a little left from the stock issue, but in 1931 the large amounts left with the American Company were largely due to the fact that the Illinois Bell could not pay its taxes in the City of Chicago. I am talking about the whole tax situation. The tax bills had not gone out. The company had the money in the bank ready to pay. It could not use the money and asked the American Company whether the American Company would take it on a 6 per cent basis and

3041 we said yes. We didn't want it. It would have been the finest thing that could have happened if we didn't have to take it or if we were not asked to take it.

The Illinois Bell did not issue any stock in 1931.

3042 In the year 1930 the Illinois Bell left with the American Company $23,022,185. That is, the gross amount of money which the Illinois Bell asked us to carry for them and to borrow from them and pay them 6 per cent interest on, was $23,022,185.

I started to explain a while ago when Mr. Blackman was examining me, where this money came from, and I think I gave about half the transaction. The second stock installment on the 1929 offer was $9,925,825, and was payable on January 2, 1930.

That is the forty million issue. At that time the Illinois

Bell had borrowed from the American Company $2,200,000 in notes, which it paid off. They had then left
3043 $7,725,000, which was left because the business depression had come into the picture. They asked the American Company to take that $7,725,000, and then in February they left with us another $3,000,000; where they got that money, I don't know, but I presume it was money that they had available for taxes, and couldn't use it. They asked us to take it. Then in February, on to June, they called back from the American Company, in nine different transactions, quite a large amount of the money they previously had with us.

Now, then, in June of that year, they borrowed $700,000 for a day or two, and paid that back. Now, the last of the three installments on this 1929 stock offer was due on the 1st of July, 1930, $9,925,825. Now, the business depression had gotten so bad that up to that time, between the second installment and the third installment, the Illinois Bell did not have to borrow any money from us, and they asked us to leave with us all but $2,000,000 of that installment. We paid back the $2,000,000 in cash, and they asked us to hold $7,900,000 for them until they needed it. And from then to the end of the year they left with us another four million odd, making up in total money left with us that year, which we were
3044 to carry for them, conserve for them and invest safely for them, and at the same time do what no other borrower would do, give them 6 per cent on it, $23,022,000.

The explanation of why the Illinois Bell had to issue this stock with the depression coming on is as follows: In 1929, when this stock offer was put out; nobody knew of the depression; we had come to a new high level. When you put out a circular offer to all stockholders (and there are a number of minority stockholders in the Illinois Bell Company) you are presumed to live up to it; and the circular put out in 1929 called for a payment in December, 1929, one in January, 1930, and one in July, 1930. Now, you are presumed to go through with a circular that you offer to your stockholders and
3045 that was just what was done in this case. The Illinois Bell Telephone Company never asked the American

Telephone and Telegraph Company to defer the issue of stock. They could have asked it, but it would have been very bad business to have done so. It would not have saved 2 per cent on $40,000,000, as $20,000,000 of that sum had been wiped out entirely by the first installment.

3046 There was a stock issue of the Illinois Bell Telephone Company in 1927. The first payment was due on the 15th of January, amounting to $14,887,350. Previous to that time, that is in 1926, the Illinois Bell had borrowed from us $13,300,000; that is the amount of debt that the Illinois Bell owed us at the end of the year. They applied the $13,300,000 against the $14,800,000 of the stock installment, and had a balance of $1,552,700. They asked us to keep that for them, so that they did not have to have the burden of carrying it at 2 or 3 per cent in the bank. And we did, we paid them 6 per cent, and within a month thereafter, they drew it away from us. They asked us to keep this on the 15th day of January, and on the 3rd of March they called for $552,700, and on the 31st of March they called for a million, so that cleaned up that transaction. Now, then, on the 31st of
3047 March they borrowed another $1,200,000, which they repaid on the 20th of April. On the 2nd of May, they borrowed $500,000, which they repaid on the 21st of May. On the 1st of June, they borrowed a million, and on the 13th of June, $750,000.

Now, on the 30th of June, there was a stock installment of $7,443,675 and the Illinois Bell owed us $1,900,000. They cancelled the $1,900,000, and kept some of the money and asked us to take $3,500,000 and carry it a little while for them. We did, and they began to draw it down in August. In September, there was another stock installment. There was no debt to cancel. Of that they asked us to keep $5,250,000, which they drew down between the 1st of December and the end of December, leaving the account at the end of the year $315,632 with the American Company.

Now, the gross cash that we held available for the needs of the Illinois Bell Company that year was, in my judgment,

about $18,000,000, $17,980,000. That was the service we rendered to them.

3048 In the year 1924 there was a stock issue installment of $1,979,500 on the 31st of March. That was paid the Illinois Bell in cold cash, as they wanted it that way. They left with us on the 2nd of January, $1,000,000. On the 4th of March we took back the Liberty Bonds, which were redeemed by the Government, and the Illinois Bell left $11,235,462 of cash with us, which we conserved for them and on which we paid them 5.53 per cent. On the 31st day
3049 of March they left another $793,000 with us. Of that money they drew down during the year, in eleven transactions, $10,584,632, leaving the American Company still owing on loan from them at the end of 1924, $2,443,944. That was carried over into 1925 and was repaid by the American Company in small amounts early in 1925.

In 1923 the Illinois Bell loaned the American Telephone and Telegraph Company amounts ranging from $10,700,000 to $12,300,000. The American Company loaned the Illinois Bell $10,573,000 the first part of the year. You have got to take the year as a whole. Part of that loan was converted into stock and part of it was advances; nearly $3,000,000 were advances.

3050 The first half of 1923 and the year 1926 are not the only years in which the American Telephone and Telegraph Company loaned money to the Illinois Bell. The American company practically advanced money through all the years to the Illinois Bell. When it advanced money it did not necessarily have balances on hand as a credit. It might have had at one part of the year small balances on hand and those were handed back, and then for a while the American Company would finance the Illinois Bell, and then the Illinois Bell would begin to pay back again.

"Q. Now on your Exhibit A-164, in determining the cost of funds as a charge against the license contract payments, you included the interest paid on loans from associated companies?

"A. I did not charge anything against the license contract payments."

3051 I simply endeavored to figure the cost of the license contract service to the American Company and its portion allocable to the Chicago area. In that case I took the cost of funds as a basis of my determination of costs. The Chicago area should bear its proportionate part.

The American Telephone and Telegraph Company holds this money available for all of the companies in a single treasury, it tags no dollars, and it could not, by the very nature of the situation, say at the beginning of the year, "We will take so much for the Chicago area, and so much for the New England Company, and so much for the Pacific Company." We have one common treasury of funds held
3052 available and that is available for the drawings of any company. The reason we cannot do it any other way is that the companies have such wide latitude through the year in cancelling the requirements they state to us at the beginning of the year and obviously the American Company cannot pick out a single company and say, "We hold so much for you, and we hold so much for you, and so much for you," because the companies have an opportunity to cancel ad lib their statement of requirements.

The money that came from the Illinois Bell to the American Telephone and Telegraph Company went into its treasury and that, together with moneys from all other sources, was held for all licensees, including the Illinois Bell. There were several licensees outside of the Illinois Bell that had these unusual transactions during this period where the American Telephone and Telegraph Company was asked to borrow money from the associated companies, but there were at the time none that had the same benefit of getting 6 per cent on money which we had to carry at 2.5 and 3 per cent.

3053 City Exhibit 142-F is not a statement of all the temporary funds loaned to the American Telephone and Telegraph Company by the associated companies. This is, in the majority of cases, proceeds from public financing.

The Illinois Bell case in 1930 was public financing, because

the Illinois Bell has, I do not know how many minority stockholders, and this stock circular was a public offering. The money which the Illinois Bell left with us was the result of a public offering of stock.

Where a company had surplus funds that were obtained from any source other than public financing, they are not shown on City Exhibit 142-F, but are included in Exhibit A-164.

3054 In 1923 the Illinois Bell had, roughly, $19,000,000 of notes to pay for property in connection with its purchase of the properties of the Central Union. I have not a definite figure in mind. In 1923 it repaid the Central Union 3055 notes out of a bond issue.

We might have made a few dollars one way or the other during the period 1923 to 1931 on the sale of these temporary and government securities. When we made such a profit, it is all in this rate that I gave ranging from 2.3 to 4 per cent through the years.

"Q. Well, as I understand it, it does not include a profit on the sale of securities in 1923 of $1,471,000; in 1928, $158,870.86; and in 1929, $539,652?

"A. Well, I don't know what you are reading from.

"Q. I am reading from the Annual Reports of the Interstate Commerce Commission, your surplus adjustments to the Interstate Commerce Commission show excess of sales price over book value of securities sold $1,471,048.90 in 1923."

That is simply reporting to the Interstate Commerce Commission on the basis that we are required. If we bought 3056 and sold government securities, we would consider any profit in connection with this surplus as a part of the rate on them. Every dollar of profit that has ever been made on government securities has been composited in the figures which I gave as showing the rate of return which the American company earns on temporary cash invested.

The Long Lines Department makes actual payments for license contract services to the American Telephone and Tele-

graph Company. The Long Lines Department is a sepa-
3057 rate department, and its earnings and expenses are kept separately, and out of its earnings it transfers to the General Department the same license payment of 1½ per cent of its gross revenues. Now, of course, you cannot pay yourself anything. In one sense, it is a bookkeeping transaction. In the other sense, considering the Long Lines as we do in this case, as in the same category as an associate company, it becomes a real transaction.

We do not consider the sale of the telephone instruments by the American Telephone and Telegraph Company's General Department to the Long Lines in the same category because that is a matter of bookkeeping.

"Q. That is, the sale to the Long Lines is a matter of bookkeeping, but the Long Lines transfer of funds to the American Telephone and Telegraph Company is not a matter of bookkeeping, but is a real one?

"A. Well, I told you a few minutes ago that there was a transfer of assets from one account to another account within the same company."

3058 I said very distinctly if you look at this thing you cannot pay yourself any money, you do not have any more when you quit, but if you look upon the Long Lines as we have in this case, as a separate unit, then your transfer of money does take on some reality.

"Q. But is there a separate unity in your consideration of the sale of the telephone instruments?

"A. I have here for this cost study treated the Long Lines as if the Long Lines were a separate entity.

"Q. Then the sale of the telephone instruments should be considered—

"A. No, it has nothing to do with it.

"Q. Nothing, all right.

"A. That is a matter of routine accounting on my books."

In connection with Exhibit A-172: the American company issued one share of its stock for each share of Teletype stock,

and then sold the Teletype stock to the Western Electric
3059 for $30,000,000. We took the Western's note for the $30,000,000 for the time being and the Western has paid that note off substantially since that time.

In connection with the sales of stock under the Employees' Stock Plans with premiums in the period 1923 to 1931, in the same year there were issues of stock at par in accordance with the terms of an offer and we also issued to employees stock on the completion of their subscriptions under the plans on the installment basis. Then, in the same year, we would issue stock in conversion of bonds. The price at which we would convert for bonds, say in 1929, was above par. The stock that was issued to the stockholders was at par. The stock that was issued to the employees was above par.

3060 I think Exhibit A-164 is very clear. What I have done, I have said that there are so many shares of stock outstanding; there are so many dollars of dividends paid on that stock, and then to that par value I have added the premium and to the sum of the two I have added the surplus, and I have related the dividends paid to the sum of the par value capital stock premiums and surplus. It has nothing to do with Employees' Stock Plans or the convertible bond issue or anything else.

The company did not pay 9 per cent dividends. The stockholders got a $9 dividend on the stock after it was issued. They paid $100 for an additional interest in the business.

"Q. And they got $9 on the additional interest for
3061 each $100 of additional interest they paid for?

"A. No, that $100 was added to whatever they had, and they got the $9 on whatever the average value of the share was worth.

"Q. Then, if, on January 1, 1924, I owned a thousand shares of American Telephone and Telegraph Company stock and I was given the right to subscribe for a hundred shares more, I paid a hundred dollars a share for the hundred shares, and I received $9 on each share of stock of the additional one hundred as well as on the old, is that correct?

"A. No, that is not correct. Take your facts as you find

them. You have had a thousand shares and the thousand shares had a book value— ,

"Q. Paid me how much in dividends?

"A. Just a minute. (Continuing.) The thousand shares had a book value of 150.

3062 "Q. What dividend did it pay?

"A. Just a minute, just a minute. If you had a thousand shares, and the shares had a book value of $150 a share, the dividend was $9, your return was 6 per cent. Not 9 per cent, it was 6 per cent.

"Q. All right.

"A. Now, then, if the company asked you to take an additional interest in its business, and they offered you an additional interest for $100 a unit of interest, and you bought a certain number of units, you would simply add that investment to that which you already have, and the dividend that you thereafter receive would be a return on all of your investment, and it would not be $9 on the additional amount put in, at all.

"Q. Will you please stick to this example, and we will get the facts? You had a thousand shares on January 1st, on which there was $9 a share paid?

"A. What was the book value of it? What was the book value of it?

"Q. The book value was X dollars or Y dollars.

"A. Well, I can't answer your question on that basis."

3064 Exhibit A-164 includes every dollar ever brought into the business for capital funds.

(On permission of the Court, witness corrected a former statement, as follows: instead of the Illinois Bell issuing a circular in 1929, the circular was issued in December, 1928.)